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PHARMACEUTICAL EDUCATION

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A Message from The President Elect of The American Pharmaceutical Association.

New Year's greetings to you Doctor Lyman as Editor, to Miss Cooper as Secretary, to the members of the Publication Board, and to all members of the American Association of Colleges of Pharmacy.

After reading through the four numbers of Volume I, I want to congratulate you on the splendid service you have rendered pharmacy in the last year. Through the American Journal of Pharmaceutical Education, constructive work is being done and I can truthfully say that I believe your publication is a great success.

I have watched the advancement of pharmaceutical education for the past thirty years in my close association with the Columbia University College of Pharmacy. I am very happy to know that our college will once again be a member of the American Association of Colleges of Pharmacy, and I hope that by the end of nineteen thirty eight you will have one hundred per cent cooperation from every worthwhile school in the United States.

I consider it outrageous that we still have so-called schools which claim to prepare students for examinations in one year as against our four-year college course. These schools, instead of increasing the number of professional pharmacists, tend to bring into pharmacy men who further commercialize our profession. I sincerely hope that by the end of nineteen thirty eight such schools will no longer exists and this aim can be accomplished if immediate war is declared on them.

I hope that our boards of pharmacy, throughout the country, will only admit candidates for examination who are graduates of the recognized schools of pharmacy which are members of the American Association of Colleges of Pharmacy, and I can assure you of my personal cooperation toward this end.

J. Leon Lascoff.

A Study of the Teaching of Pharmacology in Colleges of Pharmacy*

JAMES M. DILLE
College of Pharmacy, University of Washington

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*A Study Project of the Problem and Plans Committee.

INTRODUCTION

Courses designed to teach the effect of drugs on the living organs are the newest addition to the pharmacy curriculum. The courses in practical pharmacy, pharmacognosy and analytical chemistry have been identified with pharmacy from its very beginning but the need for the physiological sciences was not recognized until comparatively late. In 1910 a plea was made for the introduction of physiology and pharmacology into the pharmacy curriculum by Lyman (1) and in the Charter's report (2) its value was particularly stressed. This need for the physiological sciences by pharmacy has grown out of many scientific developments in numerous fields related to pharmacy. Of particular importance has been the extensive use of biological assays

as a means of determining and checking the potency of medicinals not amendable to chemical methods of assay. A further factor has been a new concept of the pharmacist. Modern methods of mass production have taken over the tasks formerly carried out by the individual and have removed the necessity for most of his manual skill. This has resulted in the conception among far-seeing educators that since a pharmacist no longer exists by reason of the skill of his hands, he must develop his mental faculties with the result that he becomes a professional man giving advice and counsel by virtue of the knowledge he possesses. Of great importance in the achievement of this new concept has been the introduction of those courses which supply this knowledge. Foremost among these have been the physiological sciences.

Therefore this survey is undertaken for the purpose of discovering how pharmacology is being presented in pharmacy schools. We want to see how this course which offers special opportunities for the pharmacist to acquire more than manual skill is being presented. To this end our investigation has been mainly fact finding. We are interested in the nature of work given to undergraduates, the opportunities for advanced work by those who are interested, the training of the men who teach pharmacology, their prestige as pharmacologists and, of special importance, the attitude of those who shape the educational policies toward pharmacology.

In order to secure this data schools were personally visited wherever possible and these problems discussed. Those which could not be visited were written to, and in order to secure definite information, a questionnaire was provided. In addition to this, the current catalogue or school bulletin was carefully studied. In some cases a personal correspondence followed which was of great value in elaborating many points. Of the 55 schools which are members of the American Association of Pharmacy Colleges 36 replied to the questionnaire. Visits were made to 16 schools of the Association. Sources of data may be summarized as follows: 12 schools, questionnaire, personal visit, and school bulletin; 24 schools, questionnaire and bulletin; 4 schools, personal visit and bulletin; and 15 schools, school bulletin only. Where no information was available on certain phases of this work, an

omission has been made in the tabulation. The data collected is more substantial than these facts indicate because in most cases the schools which did not reply were not very active in pharmacology.

Much of this data can be presented objectively and this has been done wherever possible. In other cases, however, this could not be done and statements represent a general impression. The most important features of this study do not lend themselves to a survey because in no two schools is pharmacology taught in the same way. Some schools give none of this work, two or three have elaborate departments and there are all intermediate degrees between these extremes.

PRESENT STATUS OF PHARMACOLOGY IN PHARMACY SCHOOLS—THE BASIC COURSE IN PHARMACOLOGY

With a few exceptions, practically every pharmacy school teaches something of the action of drugs. There is, however, no uniformity about the name used for these courses. Table 1 gives a summary of the names used to designate courses in which this subject matter is taught as nearly as could be determined from a study of the catalogue description of courses and information furnished by questionnaire.

It is gratifying to see that the name pharmacology is used so frequently but from the table there is no indication of the confusion that exists in many cases. Creighton calls its course "Materia Medica" but it is given in a division titled "Pharmacology." Loyola under the title "Pharmacology," gives a description of work in the first semester that fits materia medica and in the second a description of toxicology, posology and therapeutics. Philadelphia gives a series of pharmacology courses yet a perusal of the descriptions indicate that under this name physiology and materia medica are taught while actual pharmacology appears to be taught in courses titled biological assay. These are cited to show that course titles are apt to be misleading and in our study of this basic course in pharmacology we have considered the subject matter rather than the title of a course.

The time allotted to the basic course. Table 2 contains a summary of the time allotted to this basic course in which

the action of drugs is studied. In the first two sections are listed the schools where this work is given as a part of some other course and thus impossible to estimate as to time allotment. From the information in the rest of the table it is seen that the time is about evenly divided between one and two semsters.

Position in the Curriculum. Figure 1 shows at what time during the four years the work in pharmacology is given.

TABLE 1. Names used to indicate courses in which material on the action of drugs is taught.

Name of Course	Colleges Using this Name		Number
Pharmacology	Alabama	*North Carolina	27
	Duquesne	North Pacific	
	Florida	Ohio Northern	
	George Washington	Oklahoma	
	*Howard	Oregon	
	Idaho	*Philippines	
	*Iowa	South Dakota	
	Loyola	Temple	
	*Michigan	*Tennessee	
	*Minnesota	Texas	
	Mississippi	Valparaiso	
	Montana	*Virginia	
	Nebraska	Western Reserve	
		West Virginia	
Materia Medica	Creighton	Ohio	8
	Georgia	Pittsburgh	
	Illinois	Southern California	
	Indianapolis	Wayne	
Pharmacology and Toxicology	Connecticut	Washington	4
	South Carolina	Western Reserve	
Pharmacodynamics	Notre Dame	Rhode Island	2
Therapeutics	Colorado	Washington State	2
Pharmacology, Toxicology and Therapeutics	Maryland		1
Pharmacology and Therapeutics	St. Louis		1
Pharmacology and Physiology	Detroit		1
Physiology and Pharmacodynamics	Purdue		1
Physiology	Rutgers		1
Therapeutics and Pharmacodynamics	Louisville		1
Vegetable histology Pharmacognosy and Pharmacodynamics	Massachusetts		1

*Medical school departments.

TABLE 2. Time allotted to the basic course in Pharmacology.

No work given or a part of another course such as Materia Medica.... 9

Creighton	Indianapolis	Philadelphia
Georgia	Louisville	Southern California
Illinois	Massachusetts	Temple

Given in combination with Physiology..... 4

Detroit	Purdue
Puerto Rico	Rutgers

One Semester..... 14

Alabama	Minnesota (1 quarter)	Tennessee
Colorado (2 quarters)	Notre Dame	Virginia
Duquesne	North Carolina (1 quarter)	Washinton State
Iowa	Ohio (1 quarter)	Wayne
Michigan	Oklahoma	

One year..... 20

Florida	Nebraska	South Carolina
George Washington	Ohio Northern	South Dakota
Howard	Oregon	Temple
Idaho	Philippines	Texas
Loyola	Pittsburgh	Washington
Maryland	Rhode Island	Western Reserve
Montana		West Virginia

Two years..... 1

Connecticut

No school gives this work in the first year. Most courses come in the fourth year.

It seems that the third year would be the optimum time for pharmacology because by this time questions must arise in the minds of students about the physiological effects of the drugs that they are coming into contact with. It would not seem wise to put off the answers too long. Furthermore this allows the last year for possible advanced courses.

Subject Matter. The actual material taught in this basic course of pharmacology is difficult to evaluate. Most information along this line has been gathered from personal discussion and from the questionnaire. Catalogue descriptions of courses have in every case been studied but in general these are too brief to furnish more than general information about the course. Therefore, conclusions are the result of a more or less subjective estimate.

One of the indexes to this matter is the texts that are used and Table 3 is a tabulation of the text-books used in courses where this information was obtainable. It is representative but does not include every school.

FIGURE 1. The time in the four year curriculum at which the basic course in pharmacology is given.

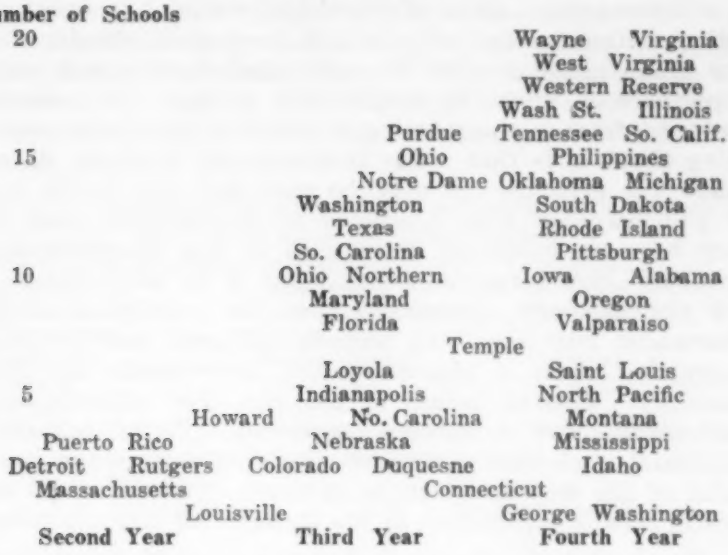


TABLE 3. Texts and frequency of use.

Text	Number of Schools Using
Sollman: "A Manual of Pharmacology"	10
Cushny: "Pharmacology and Therapeutics"	9
Bachmann and Bliss: "Essentials of Physiology"	4
Lynn: "Pharmaceutical Therapeutics"	3
Selected References	3
Mcguigan: "Pharmacology"	2
Gunn: "Pharmacology and Therapeutics"	2
Bastedo: "Materia Medica, Pharmacology and Therapeutics	2
Mcguigan and Brodie: "Materia Medica and Pharmacology"	1
Poulsson: "Textbook of Pharmacology"	1
Culbreth: "Materia Medica and Pharmacology"	1

It can be seen that the entire gamut is run, from the simple and elementary book by Gunn to the ponderous text of Sollman. This indicates that the subject matter taught in these supposedly equivalent courses is also subject to a similar wide range of variation.

Another index to the subject matter is the Pharmaceutical Syllabus. At the present time the section on pharmacology is a heterogenous mass of unrelated material jumbled together without order or attention to logical classification. The group names are for the most part obsolete and undue importance is given to insignificant groups. It provokes contempt from a pharmacologist and the most encouraging thing about it is that many pharmacology teachers do not follow the syllabus. It may be said that this is the kind of pharmacology that educators of pharmacists wish for they have so expressed themselves in the Pharmaceutical Syllabus. But I maintain that what is in the syllabus is not pharmacology approached from the standpoint of the pharmacist but something entirely different only remotely resembling what a pharmacologist understands by pharmacology. This all points to the fact that actually what conformity there is between courses of different schools is accidental, each man giving his own course from the standpoint of the way in which he interprets pharmacology and this in turn is a reflection of his background and experience.

The need for a pharmaceutical viewpoint in the teaching of pharmacology is undeniable just as it is necessary to teach pharmacology from the medical viewpoint in medical schools. But in either case, that science which we call pharmacology is unalterable. To judge from the Pharmaceutical Syllabus, much of this basic material has been ignored in getting the so-called pharmaceutical viewpoint. It is hoped that in the revision of the Pharmaceutical Syllabus that is now being undertaken that there will be a complete revision of this section with a more logical and scientific structure.

Another indication of the nature of these courses can be found in table 2. Obviously if the study of pharmacology is to be given as a part of another course, its principles cannot be as thoroughly inculcated as they would be if a separate course were devoted to the subject. Neither is it likely that information will be as extensive or principles evolved with as much care in a one semester course as in a two semester course. Other indications of the extent of the pharmacology course are shown by whether or not laboratory work is given and by the training and background of the teacher. These aspects are considered later.

Laboratory Work. First hand experience adds immeasurably to any course and particularly so in pharmacology. Students who have the opportunity to observe the actions of drugs by using these drugs in laboratory experiments or seeing their effects by demonstration have an unquestionable advantage over students who have only didactic work. Table 4 shows the schools which give laboratory work in this basic course.

TABLE 4. The frequency with which experimental work is given in the basic course in Pharmacology.

Schools giving no student laboratory..... 21

Alabama	Indianapolis	St. Louis
Colorado	Louisville	Temple
Connecticut	Loyola	Texas
Duquesne	Massachusetts	Valparaiso
Georgia	Minnesota	Washington State
Idaho	Montana	Wayne
Illinois	Southern California	West Virginia

Schools giving demonstrations to accompany lectures..... 5

Maryland	Washington
Pittsburgh	Western Reserve
Purdue	

Schools giving student laboratory..... 23

Creighton	*North Carolina	*Philippines
Detroit	Nebraska	Puerto Rico
Florida	North Pacific	Rhode Island
George Washington	Notre Dame	Rutgers
*Howard	Ohio Northern	South Carolina
*Iowa	Oklahoma	South Dakota
*Michigan	Oregon	*Tennessee
Mississippi		*Virginia

*Work given by a department of Pharmacology in a medical school.

Often in the case of the introduction of a new subject into the curriculum, a school logically prefers a conservative approach and introduces the work as inexpensively as possible, which usually means no laboratory work. Whereas laboratory work in practically every other course can be given at the nominal cost of a few chemicals and supplies, the animal material used in pharmacology is expensive to secure and maintain. This expense is not prohibitive, however, as evidenced by schools which do give the laboratory work to students. If this were the only factor, this situation could be regarded simply as a transition phase but expense is not the only objection to laboratory work. It has been said that it would take time from other courses

which are regarded as being of greater importance in the training of the pharmacist. Others believe that there is no point in training a man in physiological technique when he will ultimately find himself behind a counter as do 80 per cent of the pharmacy students. These objections are based on the conception of a pharmacist held by those who remember the glory of the old-time drug store. Our new pharmacist must, however, be a man who does more than work with his hands in carrying out the orders of another. He must work with his mind and the particular opportunity that a pharmacological laboratory offers in this respect is too great to be lost. A man is what he is because of what he has experienced and the wider and more variegated an experience a school can give its students, the more cultured, the more highly educated and the better equipped the students will be. As for using this training in pharmacological technique, it must be remembered that most pharmacists in retail work never use the detailed techniques they have learned in most of their courses.

In some cases the need for laboratory experience has been met by the use of demonstrations. These have the advantage of small expense particularly in schools where there are large classes or no facilities for laboratory work by the students. Demonstrations are of great value but their significance is greatly lessened if the student has not done similar work himself.

Demonstrations have been advocated as being superior to work done by students and the statement has been made that laboratory work requires such specialized skill that students waste practically all of their time without results. If this is the case the fault lies with the training of the students. No laboratory work in pharmacology should be attempted with students who have not previously had fundamental work in physiology and have performed basic experiments in physiology.

The amount of laboratory work to be given in this basic course or the number and type of demonstrations is again a matter of question. Certainly in either case sufficient should be given to impress the fundamental principles upon those who do not take further work, and give those who do take more work a basic training so that time need not be

taken in the advanced course to teach elementary processes.

Preparation of Students. Pharmacology is a highly specialized science. It has been regarded as a special branch of physiology which is in turn a part of the larger field of biology. Pharmacology is in fact the bridge between the physical science of pharmacy and the field of biology. Because of this specialization of pharmacology, it is impossible to teach it effectively without the background of certain other sciences, notably, physiology. Materia Medica, which is the description of the materials used in medicine, also should preferably precede the work in pharmacology so that students will have some familiarity with the appearance and physical properties of the agents whose pharmacological effects they study.

The accompanying tabulation, Table 5, gives a summary of the nature of the Physiology and Zoology or Biology courses which are taken by students before they take pharmacology. It was not considered necessary to tabulate the materia medica or pharmacognosy courses. In about 40 schools two semesters of this subject are taken before pharmacology. In other schools one semester was given or the pharmacology was given as part of the materia medica or pharmacognosy.

From this tabulation it can be seen that a number of schools give excellent courses in physiology, some of which are followed by rather indifferent courses in pharmacology. In other schools the preparation in physiology seems inadequate. It appears in the former case that a school stops short of realizing its possibilities in pharmacology even though the physiology is taught in such a way as to bring in the effects of drugs. In the second case, it is difficult to understand how a course in pharmacology in the true sense could be taught without spending a large portion of the time explaining the normal functioning of organs and tissues to lay a foundation for a study of how these normal functions are affected by drugs.

A general course in biology or zoology is also excellent experience for a student. It furnishes a background for physiology and in addition gives an experience in the animal side of biology that should supplement and enrich the botanical side which is stressed so heavily in pharmacognosy.

TABLE 5. Nature of Physiology and Biology as preparatory courses for pharmacology.

No Physiology		3
Florida	Notre Dame	Texas
Physiology without laboratory		
One Semester		16
Alabama	Loyola	
Colorado (1 quar.)	Maryland	Ohio Northern
Connecticut	Michigan	Philippines
Duquesne	Minnesota (1 quar.)	Purdue
Illinois	Montana	South Carolina
Indianapolis		Wayne
Two Semesters		7
Louisville	Philadelphia	St. Louis
Massachusetts	Pittsburgh	Temple
		Western Reserve
Physiology with laboratory		
One Semester		13
Mississippi	Valparaiso	Oklahoma
Creighton	Virginia	Rhode Island
George Washington	Washington State	Southern California
Howard	Washington	Tennessee
Idaho		
Two Semesters		5
Iowa		Ohio (2 quarters)
Nebraska		South Dakota
North Pacific		
Zoology or Animal Biology		24
Connecticut 1 sem.		No. Pacific 2 sem.
Creighton 2 sem.		Notre Dame 1 sem.
Florida 2 sem.		Ohio 1 sem.
George Washington 1 sem.		Oregon 2 yrs.
Idaho 1 sem.		Philadelphia 2 sem.
Indianapolis 2 sem.		Philippines 1 sem.
Iowa 2 sem.		Rhode Island 1 sem.
Loyola 1 sem.		Rutgers 1 sem.
Massachusetts 1 sem.		Tennessee 1 sem.
Montana 1 quarter		Texas 1 sem.
Nebraska 1 sem.		Virginia 1 sem.
No. Carolina 1 quarter		Wisconsin 1 sem.

The Teaching of Pharmaceutical Pharmacology by Medical Schools. The following pharmacy schools send their students to an adjacent medical school where they receive their course in pharmacology:

Howard University	University of North Carolina
University of Iowa	University of the Philippines
University of Michigan	University of Tennessee
University of Minnesota	Medical College of Virginia

This has usually been done wherever the presence of a medical school on the same campus provides the opportunity.

Such an arrangement has both advantages and disadvantages. There is the unquestionable economic advantage to the University of having this activity centered in one department. There is the opportunity which pharmacy students will have in the contact with men who have specialized in the field of pharmacology. There is also the advantage to the pharmacy administration in shifting the problems of pharmacology, and they are many, to an outsider. It is encouraging to see that when students are sent to the medical schools for their pharmacology they almost invariably receive some sort of laboratory work in this field. This points to the fact that where there is the opportunity, educators take advantage of it by giving students this laboratory experience.

The most significant disadvantage is the possibility that the staff of the department will be too interested in the medical aspects of this subject to give pharmacy students proper attention. I know from personal acquaintance that in some schools like the University of Tennessee and the Medical College of Virginia, the pharmacology departments are interested in the pharmacy students and take pains with them. I know also that in other schools the teaching of pharmacy students is regarded as a nuisance, usually turned over to some teaching fellow and forgotten. This latter condition is due in part to the pharmacy college which has turned the students over to others for this work and there has ended its responsibility.

There is also the possibility that pharmacy will come to regard pharmacology as something outside of its scope properly belonging to the medical schools only. This is not true because it is certainly proper that pharmacy provide and investigate new remedies before turning them over to the medical profession to be tried out against actual disease. Biological assay, too, is a problem for those who provide and maintain the potency of medicinals, and this cannot possibly be carried on without a knowledge of both the principles and practices of pharmacology. Pharmacology in medical schools is struggling to keep itself away from the influence of the clinic (3) but pharmacy is free of this influence and pharmacology in pharmacy schools can be devoted to the more abstract and probably, more scientific aspects.

ADVANCED COURSES IN PHARMACOLOGY

Most schools of pharmacy have in the curriculum the single course in basic pharmacology which we have considered in the foregoing section. This course lasts for one or two semesters and usually the work in pharmacology ends at that point. Certain schools offer further work in pharmacology in the form of special courses, which are usually elective. The table given herewith is a summary of the courses beyond the basic course already considered.

TABLE 6. Types of Advanced Courses in Pharmacology given by schools of Pharmacy. Laboratory work is given in almost every case.

Course	Number of Semesters offered	Schools giving course	Number
Bioassay	part of 1 sem.	Florida	14
	1 sem. (req.)	Maryland	
	2 sem.	Maryland	
	1 quarter (req.)	Minnesota	
	3 quarters	Minnesota	
	1 sem. (req.)	Nebraska	
	1 sem.	Oklahoma	
	1 sem.	Oregon	
	2 sem. (req.)	Philadelphia	
	2 sem.	Philadelphia	
	1 sem. (req.)	Temple	
	1 sem.	Temple	
	1 sem.	Valparaiso	
	1 sem.	Washington	
Advanced Pharmacology	4 sem.	Florida	7
	1 sem.	Maryland	
	3 sem.	Nebraska	
	1 sem.	Oklahoma	
	1 sem.	So. Carolina	
	2 quarters	So. Dakota	
	2 quarters	Washington	
Pharmacology Research		Florida	4
		Maryland	
		Nebraska	
		Washington	

Due to the great variation in these courses between the different schools it has been very difficult to make this compilation. The line of demarcation between the basic course and these advanced courses has also been difficult to draw. We have tried to include only those courses which deal with the action of drugs and closely related subjects,

thus eliminating such courses as first aid and biologicals which in some schools are taught as pharmacology. The advance courses offered by medical school departments of pharmacology are also not included because although often open to pharmacy students they do not truly represent pharmacy. Of the schools surveyed twelve offer courses beyond the basic course. Of these twelve, three offer only one additional course while opportunity to do any extensive work is offered only in four schools.

Courses in biological assay occur most frequently. Usually one semester or quarter of this subject is offered although in a few cases more than this may be taken. This popularity of biological assay is as it should be, but it is still ignored in the largest number of schools and in view of the fact that bioassays are important official methods these schools must be regarded as failing to fulfill an important obligation to their students.

It is, of course, natural that work in pharmacology should develop more rapidly in some schools than in others. But when so few schools give nothing more than the single basic course the conclusion that pharmacology is regarded as a minor part of pharmacy is inevitable.

RESEARCH ACTIVITY

It has been difficult to separate pharmacological research from that done along more truly pharmaceutical lines. From the foregoing section it is seen that advance courses in pharmacology are confined to only a few schools and still fewer offer opportunity for students to do research work for a degree. This in itself, however, does not preclude the possibility of a man doing pharmacological research, and in several cases research has been done under such circumstances and these men deserve special commendation.

Good work has been done by Dr. M. R. Thompson at the University of Maryland. His work on the new ergot alkaloid has been regarded with esteem by all pharmacologists and is an example of what can be accomplished in a pharmacy school along these lines. It is significant that at the University of Maryland it might have been possible to send students to the medical school for pharmacology. If this

had been done this research which has redounded to the greater reputation of pharmacy would never have been done.

The University of Florida under Dr. B. V. Christensen has also been active especially in the development of new bioassay methods. Work in other schools must include that of E. T. Stuhr at the University of Oregon, Dr. Kaczmarek at Notre Dame and Dr. L. D. Edwards at Western Reserve. The University of South Carolina is also active.

Of perhaps more significance are the future possibilities along these lines. Developments are occurring which are bound to bring favorable reactions not only in the reputation of the whole of pharmacy and the school itself but in better teaching of this subject and the stimulus to activity in other divisions of pharmacy. There has been the addition of Dr. H. G. O. Holck to the staff of the College of Pharmacy at the University of Nebraska to devote full time to pharmacology and the enlargement of this work at the University of Washington by a similar appointment. Both of these departments are undertaking ambitious research programs and already have papers in press. Other schools have also signified their intention of developing pharmacology to a greater extent but nothing tangible has yet been done.

As to the need for pharmacological research in pharmacy an observation of special significance can be made in the section on Pharmacology and Bioassay of the 1935-36 issue of the "Annual Survey of Research in Pharmacy." Out of the 240 references in the pharmacology section one can find only two or three pharmacy schools represented. It appears that there is enough activity of pharmacological interest to pharmacists to produce 240 papers in a year yet pharmacists are content to let the work be done by outsiders.

The reason for slow progress in research is unquestionably one of expense but there is in addition the problem facing most educators as to whether the return justifies the expense. Are the returns in such intangible things as prestige or reputation in a field which has nothing to do with the act of filling a prescription worth the cost? In seeking the answer it must also be remembered that a real teacher does not teach from a text-book but from his first hand experience. Pharmacological research and teaching are in-

extricably bound together and if we are to achieve our new concept of a pharmacist by teaching pharmacology we must go the whole way for no mere text-book teacher can teach an experimental science like pharmacology. He must do the work of a pharmacologist or he fails.

THE PHARMACOLOGY TEACHER

We are interested in the pharmacology teacher not from a personal standpoint but from the standpoint of how his experience, qualifications, teaching load and position on the staff affect pharmacology in the school where he teaches. To this end we have selected certain things which enter into the makeup of a teacher and have tried to see how these affect the type of course the student is likely to receive.

Professional Training. One indication of the standard of pharmacology is the training of the teachers. We have tabulated in table 7 the degrees held by those who teach this subject.

TABLE 7. Degrees held by those who teach pharmacology. Only the highest degree is indicated.

Degree	Number Holding
Ph.D.	15
M.D.	13
Ph.D. & M.D.	3
Ph.G. & M.D.	2
Ph.M. & M.D.	1
Phr.D. & M.D.	1
M.S.	9
M.A.	3
B.S.	6
Pharm. D.	4
Pharm. M.	1
Ph. G.	2

The degree of M. D. occurs with greatest frequency but this is due in part to the inclusion of medical schools and to the fact that some schools solve the problem of teaching pharmacology by employing a doctor who devotes part of his time to practice or other activity. The degree of Ph. D. occurs with the next highest frequency.

This tabulation is not necessarily an indication of the ability to teach pharmacology but rather of the educational attainment of the teachers. The actual training and ex-

perience in pharmacology would be a better index but it is too difficult to secure worth-while data on this score to make a tabulation of any significance. Disregarding the men in medical schools, very few have had any formal experience either in physiology or pharmacology before taking over this work. A few who have gone into this field have done excellent experimental work. Others regard themselves as pharmacologists yet they have given no evidence of any experience with the laboratory side of this subject.

We have also tabulated in table 8 the rank in the university or school held by those who teach pharmacology.

TABLE 8. Professional rank held by teachers of pharmacology.

Rank	Number Holding
Professor	31
Associate Professor	"
Assistant Professor	9
Research Associate	1
Instructor	8
Assistant	7
Lecturer	3

This indicates that about half of the teachers hold the rank of professor. Again this is misleading because many hold this rank by virtue of their activity in other fields and teach pharmacology as a side issue. If, however, scholastic degree or academic rank are any index of education and scientific attainment, then it seems fair to assume that these courses in pharmacology are taught by men of more than average ability in some field.

Other Subjects Taught. Obviously in many schools, particularly those of limited enrollment, it is necessary that the man who teaches pharmacology must also teach other courses. Whatever the reason an examination of these subjects is made in table 9.

TABLE 9. Frequency and nature of courses which teachers are called upon to teach in addition to pharmacology. (Medical school work and part time work is not included).

Subject or Activity	Number of times this occurs
Pharmacognosy	18
Materia Medica	9
Physiology	8
Medical Pharmacology	8
Bacteriology	6
Pharmacy	5
Employed part time	5
Dispensing Pharmacy	4
First Aid	4
Botany	4
Dean	4
Toxicology (chemical)	3
Prescription compounding	3
Commercial Pharmacy	3
Clinical Analysis	3
Pharmacy Law	2
Zoology or Biology	2
History of Pharmacy	2
Microscopy	2
Household Remedies	2
U.S.P. and N.F.	2
Incompatibilities	2
Manufacturing Pharmacy	2
Food and Drug Analysis	1
Prescriptions	1
Biochemistry	1
Prescription Practice	1
Biologicals	2
Public Health	2
Plant Histology	1
Pharmacy Mathematics	1
State Board Review	1
N.N.R.	1
Cosmetics	1
Hygiene	1
Pharmaceutical Chemistry	1

This is an astounding compilation. The variety of subjects and duties which have been combined with pharmacology seems to be limited only by the extent of the curriculum. In most cases there is no basis for the combination. Physiology or even Biology, which have more in common from an experimental point of view, appear fewer times than pharmacognosy or materia medica. From this we are forced to conclude that in schools where this occurs the pharma-

cology probably does not have more in common with these subjects. It appears that the separation of these two which has been so long advocated is not yet completed.

In the following table is summarized the number of other subjects or duties which pharmacology teachers are called upon to teach in addition to pharmacology. Only schools where definite information was available are included in this table. Medical schools and schools employing a part-time man are also omitted.

TABLE 10. The number of subjects *in addition* to pharmacology which a teacher is called upon to teach. (Medical schools and part time work is not included)

Number of subjects	Schools	Number of schools
7	Montana	1
6	Alabama	3
	Creighton	
	West Virginia	
5	Colorado	9
	Detroit	
	Indianapolis	
	Oklahoma	
	Oregon	
	Pittsburgh	
	Southern Calif.	
	Washington State	
	Valparaiso	2
4	Idaho	
	Wayne	
3	Florida	2
	Rutgers	
2	Louisville	4
	Philadelphia	
	Rhode Island	
	Western Reserve	
1	Massachusetts	1
0	Maryland	3
	Nebraska	
	Washington	

This tabulation is not intended to be an estimate of the teaching load since many subjects may require only a small amount of actual time, but rather to show how frequently and to what extent a man must divide his energies. If a man must teach, in addition to pharmacology, five or six other subjects, the only conclusion tenable is that every subject must have very low standards or that one has been developed to the exclusion of the others. Such a situation is incom-

patible with real education. It occurs of course in schools with small enrollment and limited budget, but whatever the cause the result is bound to be bad not only as regards pharmacology but as regards the product of such schools and the effect on the whole profession of pharmacy.

THE ATTITUDE OF PHARMACY SCHOOLS TOWARD PHARMACOLOGY

The Name. One of the significant indications of the attitude of pharmacy toward pharmacology is the apparently unexplainable confusion regarding the name for a course which shall have for its purpose the teaching of the action of drugs.

As table 1 indicates most schools have adopted the name pharmacology. Some, however, persist in using obsolete and misleading titles in spite of numerous recommendations by teachers, the "Pharmaceutical Syllabus" and "Basic Material for a Pharmaceutical Curriculum." This is due in part to the fact that pharmacology can be defined in two ways. It can be used generically to include both the physical description of drugs and their physiological effects. This is the way in which the term has been used by Newton (4) in a recent study of the pharmacy curriculum. The term pharmacology may also be used as Cushny (5) uses it to designate "the study of the changes induced in living organisms by the administration in a state of minute subdivision of such substances as do not act merely as foods." Used in this way pharmacology and pharmacodynamics are synonymous terms. The term pharmacodynamics has been suggested as being more specific and some have advocated its use. It appears to me, however, that it has the disadvantage of being long and comparatively restricted in its usage. The term pharmacognosy is used almost universally by medical schools and it therefore appears that this term should also be used in pharmacy schools to designate this work. It is true that in medical schools the department of pharmacology is called upon to teach such subjects as materia medica, prescription writing or pharmacy. But these courses are never confused with pharmacology.

The name therapeutics is an unwise choice because in medical curricula such a course indicates the study of remedial agents, among which drugs are important but by

no means the only agents used in the treatment of disease. If such is taught, then it is proper to so label the course but in general we do not want to teach how to treat disease; to do so would involve more than a consideration of drugs.

The term toxicology should also be used with care. Where it deals with the physiological manifestations of poisons, or their treatment, it is properly a part of pharmacology. The toxicological analysis of poisons by chemical methods is not a part of pharmacology and neither is the pathological changes brought about in the tissues by poisons.

The Need for Pharmacology. There is by no means a uniformity between the various schools of pharmacy as to whether this work on the action of drugs which we term pharmacology should be given. Some schools are frank in stating that a pharmacist does not need to know about the action of drugs in order to be a good pharmacist. Other schools have this same conviction but are not as frank about it and have instituted half-hearted courses in pharmacology which have little more than the name. They have for the most part used these courses as catch-alls wherein a miscellaneous assortment of items, some of which truly belong to the subject of pharmacology while others, like "sick room appliances" belong to commercial pharmacy, or like "biologicals, serums and vaccines" belong to bacteriology.

To better show this attitude of pharmacy toward pharmacology, following are some statements taken from the questionnaire or repeated as nearly as possible from conversations. These are not intended to be a reflection upon the convictions of any individual but are given to elucidate this point.

> "It is of value in many ways. Perhaps the greatest value is the appreciation and broader understanding of drugs which it gives the student. It gives students a keen appreciation not only of the actions and benefits of drugs but also of the dangers and possible harmful effects."
>
> "Personally I am very much interested in seeing pharmacology develop here. My own interests are in medicinal organic chemistry and we need a tie-up between chemistry and pharmacology in order to test out new compounds."
>
> "The field of pharmacologic research is so vast that there is ample room for all interested. Many crude drugs are in need of investigation—these as a rule are avoided by medical men. Pharmacy needs some worth-while contributions to its credit."

" . . . this is not possible unless the teachers are sufficiently well trained. Actually there are but few such individuals who have had sufficient experience in pharmacological methods, their difficulties and the interpretation of the results for such work to be of great value."

"It is our opinion that students should observe the action of potent drugs and poisons on experimental animals."

"Permit me to state that at the present time, I feel that the greatest short-coming in the development of this work is the lack of pharmacologists who are really trained in the fundamental principles of this work, and that no amount of survey work will will be of any benefit until the administrators of the schools recognize that a pharmacognocist cannot be made over to a pharmacologist by simply changing his title. Neither do I believe that a selection of men trained in purely medical pharmacology without an understanding of the fundamentals of pharmacy are qualified to support the development of this course."

"I do not believe it is possible for students to learn too much about the actions of the drugs, but there is a limit to what can be included for the undergraduate student without sacrificing some other phase of pharmacy which is likewise essential."

"Graduate work should be developed comparable with that of the other phases in the pharmacy school."

"It is my opinion that an elementary course in pharmacology would undoubtedly benefit students in pharmacy who will not take graduate work. However, pharmacy curricula are usually so crowded that it is nearly impossible to find the time for this type of work. Relative values of courses to pharmacy students should be very carefully studied."

"It is my opinion that work in pharmacodynamics, in order to be profitable, should be comparable at least to that offered in grade A medical schools. The amount of preparation required for this is hardly possible for the rank and file of pharmacy students."

"Research in pharmacology in pharmacy schools should be mainly along the lines of quantitative biological estimation of drug action. This is especially the pharmacist's field, and one which the physician cannot conveniently pursue."

" . . . the student should leave the pharmacy school less liable to sell 'any' patent for any condition as is now the case.

"Pharmacology should buffer the conscience of those most needful. On the other hand the chain store or at least most of them want salesmen not ethically trained scientific men. In this section a strictly professional man would have a tough time of it."

"During the past three years here at ———— we have included a laboratory course in pharmacology. Due to the fact that our department operates only on fees paid in by the student, except for salaries, we are not able to purchase apparatus and equipment for more detailed and complicated experiments. Our aim has been to make the laboratory work as practical as possible. Experience has taught us that didactic material in pharmacology is mastered by the student more quickly and

thoroughly when laboratory is given. Whether the student expects to continue with graduate work or not, it is our firm belief that student laboratory work should be included in the curriculum."

"Where will the students trained in pharmacology get positions? There are 225 to 250 positions in pharmacology available in this country and the possibility of expansion is improbable. Assuming that pharmacy students were given extensive pharmacological training, they would have no occasion to use it."

" . . . would have instituted pharmacology laboratories some time ago if I had seen any value of it for pharmacists."

"Consider extensive research properly belongs to medical schools. The time allotted pharmacy students in the four year curriculum does not allow extensive work."

" . . . it would be of excellent value as a meeting ground for pharmacists and medical men."

"Primarily students are not prepared by enough familiarity with anatomy and experimental physiological (real mammalian work) to undertake the laboratory work with any degree of success."

From this evidence, which is representative, it appears that there is not an attitude toward pharmacology, but many attitudes. On the whole I believe that these are favorable, but there is no uniformity of opinion about many of the problems that are of great practical concern to a teacher of pharmacology.

Objectives in Pharmacology. I cannot help but feel that there is a great possibility for the growth of pharmacology until it reaches maturity and becomes equivalent to the other divisions of the pharmacy curriculum. With this as a possibility some time should be devoted to a consideration of its characteristics when it reaches its full stature.

Therefore I believe that one of the objectives of pharmacy educators should be to answer the question, "What kind of pharmacological training should a pharmacist receive?" At the present time there is no agreement and the task of the pharmacology teacher is much harder because of this. We as pharmacologists know what kind of pharmacology we would like to see pharmacy students get but it is not fitting that we should provide an answer. We are too close to our subject for proper perspective and in our enthusiasm we would lay ourselves open to the suspicion of "lining our pockets." We have another objective. We must show the usefulness and value of pharmacology. We must see that our students have an understanding of not only the facts

of pharmacology but its philosophy as well. We must also do scientific work and by our work show the possibilities of pharmacology. Before shaping a policy pharmaceutical educators must give careful consideration to many factors and try to consider not what the pharmacist has been or what he is now but what he will be in the future and that our conception of the pharmacist is a man who has knowledge as well as skill.

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ABSTRACT OF DISCUSSION

Dr. A. G. DuMez, Baltimore, Md. I would like to commend Dr. Dille on the very fine report which he has made. It seems to me this is exactly the kind of work that should be done as a basis for the revision of the Syllabus and naturally in a compilation of this kind there will be some errors. I found a few, two or three, with regard to the school which I represent, but I am sure that they are not serious errors and I presume that Dr. Dille will send these around and ask the pharmacologists to correct them for their own schools.

Dean J. Grover Beard, Chapel Hill, N. C. As I view pharmacy, its primary function is to prepare medicine suitable for administration on the prescription of a physician, and certainly an intelligent approach to research in manufacturing medicinal substances requires that the pharmacist knows how to test their physiological action. It is the function of the pharmacist to establish these products. That is his specific duty laid down by our pharmacy laws, and the pharmacist should know how to test products that require biological methods for standardization. I hope that more schools of pharmacy will take an interest in pharmacology and that they will improve their courses in that subject. I think that Dr. Dille is quite right in saying that the description of the course in pharmacology as suggested in the last Syllabus is wrong. I think that in the new Syllabus a complete revision of the section on pharmacology should be undertaken. I rather envy Dr. Dille for some of his very definite opinions. Although I have been teaching in this field for some years my thoughts have not crystallized so clearly. I should like to ask Dr. Dille what he finds the attitude of medical men to be towards

the teaching of pharmacology in pharmacy schools? This is a subject which they have held belongs peculiarly to the physicians.

Dean A. B. Lemon, Buffalo, N. Y. No one has called attention to it and I think that the practicing medical profession is against giving very much pharmacology to pharmacy students. Perhaps this is something that must be considered. I believe that pharmacology must be taught to pharmacy students with a considerable amount of diplomacy and tact so that when they get into the field they are not going to do anything that will make the physicians feel that they are usurping their field. We are criticised for counter-prescribing and the doctors in my city tell us frequently that we are trying to make doctors out of our pharmacy students by teaching them pharmacology. Then they go out in the field and practice medicine. We tell our students that the pharmacology that is given to them is for the purpose of giving them a better understanding of these drugs so that they will not counter-prescribe. But you have quite a job to get that over to the physicians sometimes.

Dr. Rufus A. Lyman, Lincoln, Nebr. Dr. Lemon's remarks remind me of what happened twenty-nine years ago. At Hot Springs, Arkansas, at a meeting of the American Pharmaceutical Association, I sat by Dr. Edwin DeBarr, Professor of Chemistry at the University of Oklahoma. Some far seeing soul had just delivered a paper upon the importance of teaching bacteriology to students of pharmacy and Dr. DeBarr almost flew into a rage. He said: "The minute you do that you are locking horns with the medical profession." I would like to see the man today who thinks that bacteriology ought not to be taught to a pharmacy student. I am very certain that without a laboratory course in bacteriology the pharmacist today would be considered disqualified to deal with the vast number of agents of precision which the pharmacist has to guard and handle in order to keep them instruments of precision for the treatment of disease. As a medical man, I was trained in pharmacology from the therapeutic point of view, and not from the viewpoint of standardization and the production of instruments of precision. There was never a time in the history of medical science when pharmacists have had to have such a comprehensive training as now for the intelligent practice of their profession. Twenty-nine years from today, and in much less time than that, medical men will be glad to know that the men who manufacture and the men who preserve and distribute these tools of medicine have been trained so that they know what they are doing. In the report of the Commonwealth Study of Pharmacy, Dr. Charters makes this statement in substance—"The safety of the community and the usefulness of the pharmacist depends, not on keeping knowledge from him about the materials which he handles, but in giving him more knowledge." In other words, the protection against counter-prescribing by the druggist is more knowledge and not less knowledge—less ignorance, not more ignorance.

Dr. J. M. Dille, Seattle, Wash. First, Dr. DuMez, I will be very glad to correct any errors in this mimeographed report before it is finally published. I am very anxious to have this study as accurate as possible. Dr. Beard, as regards the attitude of medical schools toward the teach-

ing of pharmacology in pharmacy schools, I have heard many diverse opinions. If I may be a little personal, when a year ago I left a medical school in Washington, D. C. to go to a pharmacy school, I visited a pharmacologist whom I knew. He said to me, "Now Dille, you are going out there and you have a splendid opportunity, but do not stay in a pharmacy school too long. Get all of the experience that you can and when you get the chance, come back into medicine. Medical schools are the only places where real pharmacology is taught." I said little, but my opinion is that pharmacology belongs to pharmacy as much as to medicine. My former chief, Dr. Koppanyi, has said that pharmacology is the very soul of pharmacy, and I am convinced that it is. One of the reasons for this is that medical schools are now adopting the therapeutic attitude toward pharmacology and one finds in medical schools an objection to a man who holds only a Ph.D. degree in pharmacology. They want a man who has an M.D. because they say he has the medical attitude towards drugs. That has resulted in a puritanical type of pharmacology which is very unhealthy and only a few are truly scientists. On the other hand, pharmacy students with their background of training in pharmacognosy, pharmacy, chemistry and physiology have a scientific background that is splendid for developing a real scientific pharmacologist.

Methods for Making a Literature Search in Pharmacology*

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A literature search is usually made for one of the following reasons: (1) the preparation of a term paper, or (2) as a preliminary task before beginning laboratory work on a research problem which may or may not involve writing a thesis. In either case if the finished product is to be worth while and of value to the student it must be complete and accurate and the final presentation, which in the first case will be a term paper and in the second the history and introductory portion of the thesis, must be logical and systematically organized.

To insure completeness it is necessary that the student find every publication on the particular problem which he has selected. At first sight this appears like an impossible task, but if the problem is so chosen as to delineate a carefully selected field and if one takes advantage of the

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many aids in the form of Indexes and Abstract Journals this is not an insurmountable task. In order to achieve accuracy the final report which the student writes must report exactly what their authors wrote. To this end there must be an intermediate step between the original paper and its final presentation by the student. This intermediate step is the abstract which is made from the author's original paper. Abstracts may be short or long depending upon exactly what the student wants from the particular paper he is examining. The tendency is to make them too superficial, resulting in the necessity of returning to the original article a second time, a task which involves no great difficulty if the original is close at hand, but which may be extremely troublesome of the original must be sought at some distant place.

PRELIMINARY PROCEDURES

Delineation of the Problem

The first step is the delineation of the problem. One may be interested in some such subject as alcohol or caffeine but to attempt to write a paper of such an extensive field would be almost an endless task because literally thousands of articles have been published on each of these two drugs. Therefore the field must be limited. What the limits are will depend largely on circumstances. One may have read or heard something provocative of thought, or some first hand experience in the laboratory may have suggested a problem upon which one wishes information. These factors serve as guides for limiting the field. If one wishes to know, for example, about the formation of tolerance to caffeine, the literature is immediately largely confined to this aspect of the pharmacology of caffeine and one may regard the other facts about caffeine with secondary interest.

Orientation

The second step involves a search for information in various text-books in order to secure a general idea of the problem and to orient oneself for a future more detailed search. In general most text-books are several years behind present developments in the field and because of their space limitations cannot present all of the data which might

bear on the subject one wishes to investigate. The author out of his experience has selected the material which he believes to be of the greatest general interest to all readers, hence the particular topic in which the student is interested may be omitted or only superficially treated. In general, however, a survey of several text-books makes an excellent starting point for a literature survey and following are some text-books in Pharmacology which serve this purpose in excellent fashion:

Sollmann: "A Manual of Pharmacology," 5th Ed. 1936
Bastedo: "Materia Medica, Pharmacology and Therapeutics" 1932
Edmunds and Gunn: "Cushny's Pharmacology and Therapeutics," 11th Ed. 1936
Cohen: "Pharmacotherapeutics" 1928
Meyer and Gottlieb: "Pharmacology"
Heffter: "Handbuch der experimentellen pharmakologie." This is comparable to Beilstein in chemistry in that it attempts to survey all the developments in pharmacology.

It will be noticed that these contain bibliographies some of which, like Sollman, are intended to be quite complete, while others, like Cushny, give only articles of special importance or significance. If more information is desired for orientation these may be perused but in general abstracts need not be made at this point.

In addition to the general text-books of pharmacology there are other books of a special nature which may be consulted in such fields as endocrinology, anesthetics or biological assay. The student finds these by consultation of the card catalog of his library.

MAKING THE SURVEY

When this orientation period is complete and the student has in mind exactly what his field is the next step is the actual survey of the literature and the making of abstracts of each significant paper. This survey may be made in either of two ways:

Plan I. It will be remembered that various text-books contain bibliographies. One may find the articles referred to,

peruse and abstract them. These articles contain references to other articles previously published and these may be found and studied. These in turn refer to other articles. Thus by proceeding backward in this manner, eventually most articles will be uncovered.

This plan is satisfactory only in very specialized or limited fields. It offers no guarantee of completeness and since completeness is usually essential this plan should not ordinarily be used. It is, however, a means of rapidly becoming familiar with a given subject in a short time and preliminary surveys are frequently made in this manner. Also in the case of work published before index and abstract journals began or were as complete as they are now, this is the only plan which can be used.

Occasionally one finds a review published which purports to be a survey of all of the developments in a field up to the point when the review was published. There are journals such as "Physiological Reviews" and "Chemical Reviews," which publish only papers of this nature. In most cases these reviews are extremely valuable to the student who is making a literature survey because they contain extensive bibliographies with a discussion of each paper. They must not be regarded as infallible, however, because in most cases the author reserves the right to include in his review only those original papers which he considers significant. Thus he may have eliminated something of importance to the student. One should judge a review by the familiarity of the author with the field. Anyone may work over the literature on a subject and write a summary of it in the form of a review; but unless he has actively done original research in that field himself the review is probably uncritical and lacking in depth and understanding. On the other hand a review may be biased by the very fact that the author has been too close to his own work to see it in its proper perspective. In general, however, reviews are an invaluable aid to one making a literature survey both for their bibliographies and as a means of orientation, but we must keep in mind these limitations.

Plan II. This plan is a more logical procedure and is the one that is usually followed. It involves the use of Indexes and Abstract Journals and it can be said without exaggera-

tion that without these valuable aids scientific research would be immeasurably harder than it is.

Journals of this nature which are of value to the pharmacologist are:

"Quarterly Cumulative Index" and the "Index Medicus."

The quarterly cumulative index began in 1916 and may be regarded as a continuation of the Index Medicus which was discontinued in 1926. It is an Index and gives only the titles of the article or publication. It is intended to be very comprehensive for medical literature. Clinical uses and therapeutic actions are sure to be found in this Index.

"Index Catalogue of the Library of the Surgeon-general's Office."

This is an index of books and articles of journals found in the library of the Surgeon General in Wahington, D. C. It would not be of such value were it not for the fact that this library is probably the most complete medical library in the world. It has been published in three series, the last of which is the most recent showing the publications from 1918 to 1932 depending on the volume. Series IV is in preparation.

"Chemical Abstracts."

This was begun in 1907 as publication intended to abstract mainly for chemical literature, but it has been expanded and now includes excellent abstracts in pharmacology with a special section for that field began in 1912.

"Biological Abstracts."

This journal began in 1926. It is intended to present abstracts of the entire biological field. At the present time it is behind the current literature in some cases more than a year.

"Physiological Abstracts"

This covers the physiological literature from 1916 to the present time. It stresses the physiological journals but includes journals of pharmacological interest also.

"Royal Society Catalogue of Scientific Papers." 1867.

"International Catalogue of Scientific Literature." 1907.

These are of general interest. The first because it goes back so far and the second because of its physiology portion which is of interest to the pharmacologist.

The student should familiarize himself with the general makeup, method of classification and nature of these publications and should notice what journals are indexed or abstracted by them.

The subject for the literature search is then analyzed to determine under which headings of the abstract journal a paper concerning it is likely to be listed. The problem of tolerance to caffeine is comparatively simple. One would look for the topic, "caffeine" and search under that heading for some reference to the tolerance produced by caffeine. To make doubly sure one would look under the heading "tolerance" for caffeine; although usually cross indexing of this sort is very efficient. Other topics might require a search under several headings which should be determined beforehand and systematically investigated.

Reference Cards

The most convenient way of handling the numerous references which one finds as soon as the abstract and index journals are searched is to write each reference on a 3 x 5 filing card. These may be classified or rearranged whenever the occasion demands. In the case of an Index publication like the "Quarterly Cumulative Index" the card will have only the title and the reference, but in the case of an abstract journal like "Chemical Abstracts" the abstract may be copied on the card either in its entirety or in a few sentences recalling the substance of the abstract. An example of a convenient method of writing data on the filing cards is as follows:

> Tolerance and Cross-tolerance in the Human Subject to the Diuretic Effect of Caffeine, Theobromine and Theophylline.
>
> N. B. Eddy and A. W. Downs
>
> Jr. Pharm. Exp. Therap. *33* 167-174, 1928.
>
> (Space for brief abstract)

This order need not be followed if another is preferred but the cards should be uniform. References are best given as above and in case the original is in an obscure journal which is known to be unavailable it is best to put down also the reference to the abstract journal.

In covering the several abstract journals one comes across a reference to the same article several times so in

order to avoid duplication it is best to file the cards according to authors so that before a card is made one can readily check whether or not that reference has already been secured from an abstract journal previously searched.

When this survey is completed the student will now have anywhere from a dozen to a couple of hundred cards. He can rest assured that if the work has been done carefully he has culled every reference bearing on his particular problem up to the time when the last volume of the index or abstract journal was published. Responsibility does not cease here, however, because one must check each issue of at least one abstract journal as it is published in order to keep up with the most recent publications.

PREPARATION OF ABSTRACTS

Thus far the student has not yet looked at the original literature for which he has been compiling references. His next task is very important. It involves reading and understanding the original publication, from which must be extracted the salient features which must be put down on paper in some form so that they will be useful later when one comes to evaluate the work and compare it to the work of others.

A scientific paper must not be read like an essay or a story or even a textbook. These are read for information which the reader accepts without particular question. A scientific paper on the other hand must be read with a critical, questioning mind. A general survey of the paper should first be made. Study its title, look at its illustrations and tables and read the conclusions. Then read the paper carefully. Look for the methods which were used. Could others have been used? Why were these used? Look at the results. What significance has the whole paper to the subject being investigated and finally are they sufficient to justify the conclusions?

After you have read the paper in this way decide what you want out of it for your purpose. You will want to know such things as the kind of animals used, doses, manner of administration and many other details later which appear unimportant now so be sure to include them along with the more general things. Make your abstract a real abstract

containing the essence of the paper. Beware of writing simply a description of the paper; later you will want to know what is in it, not what it is about.

Naturally the length of abstracts will vary. Some papers will be disappointing and data from them may be put on the card which was written when the references were compiled. Others will be too long to be placed on this card in which case a note is placed on the card to the effect that a detailed abstract was made. This extended abstract is written on a full size sheet and should contain the same information as to title, author and reference as the card.

Under ideal conditions this progresses very smoothly, but the student will not have gone very far before be encounters difficulties. The first may be an article published in a foreign language. Fortunately the bulk of pharmacological literature is found in English, German and French and it has been tacitly assumed that the student has a reading knowledge of these languages and in all universities where advanced degrees are awarded a reading knowledge of these languages is a requirement. In some schools fulfilling this requirement is a formality which is easily passed, and a student may congratulate himself on so easily having overcome this obstacle but the real test comes in the use which can be made of these languages in a literature survey such as this and a student who has learned his foreign languages well will thank his good fortune many times when he has occasion to make a survey of the literature.

One cannot be familiar with all languages, however, and occasionally an important article will be found in a language other than English, German, or French. Recently pharmacological research has been developing rapidly in Italy with a resulting increase in important papers in that language. In this case the student may have to impose on a friend or colleague for a translation or depend on the abstracts which he finds. The latter course is permissible only if the paper is comparatively unimportant, but one must be very careful in judging the importance.

Another problem one soon encounters is the absence of certain journals which contain desired articles. Only a few libraries have the funds to subscribe to every journal of importance so the tendency is to specialize. Pharmacologists are particularly unfortunate because in addition to the

special pharmacology journals, they require the medical journals and frequently need chemical and biological journals as well. When an article cannot be secured because the journal is unavailable several courses are open. The easiest is to depend on the abstracts and a fairly good idea of the contents of the article can be secured by reading each of the abstracts in "Chemical Abstracts," "Biological Abstracts" and "Physiological Abstracts." These will usually tell one whether the original is worth the trouble of getting. If it is desirable to secure the original article this can be done in several ways. Most libraries maintain a loan service by which they can borrow from other libraries at a small cost and one can secure the proper volume of the journal in this way. Another plan is to have photostats of the article made by the library which has the journal. This is the only alternative in the case of old and valuable volumes which the library will not lend. The Surgeon general's Library of Washington, D. C. renders this service and this library is of most importance to the pharmacologist. Photostats are quite expensive, costing about 10 to 15 cents per page and a recent service has been inaugurated by the Department of Agriculture Library for the production of Filmstats. These are copies made on movie film and are read with the aid of a magnifying glass or a projector. Their cost is one cent per page with a service charge of 20 cents per article. This is the most inexpensive way of securing an article not available locally, but it is at present confined to the Department of Agriculture Library at Washington, D. C.

Whatever the method used one should make every effort to see the original article. This is of the greatest importance if it is necessary to use a method devised by some one else. An abstract is not expected to give the details of the procedure and so the original must be consulted.

WRITING THE PAPER

During all of the preceding work the student has been learning a great deal about his subject and he is now ready to write his paper or to plan the laboratory work for his research. In case the former is the object of the search he is ready to begin actual writing. From his knowledge of

the subject gained by the search he should have no difficulty in organizing the material because it should readily group itself into certain natural divisions. If it does not do this then the student needs to put further study on the subject.

The actual writing is a problem of synthesis and organization. The first draft should be written with this in mind, making use of the abstract which has now been arranged into groups according to the outline previously decided on. Later revisions will improve the grammatical structure, and round out the whole paper with particular attention to making it readable. The paper should not be a series of abstracts but should be a real account of the subject in which the papers quoted may in a way be regarded as illustrative of the points one wishes to bring out. To this end while writing the paper the student should give minor attention to authors and pay attention chiefly to the work which has been done.

The general problem of style may prove bothersome. By style is meant the form of the finished paper. It involves such matters as the type of heading to be used, the manner of designating the separate portions of the paper, the kind of abbreviation which shall be used as kg. or kgm. or kilo. and many other details which make a uniform, easily read paper. These problems had best be left until the paper has been completed as far as contents are concerned. It is extremely distracting while writing a paper with one's mind on the subject matter to be bothered with such a problem as whether per cent should be written out or designated by the symbol. After the paper has been thoroughly revised and has reached the stage where the writer is satisfied with its organization and contents, the style is determined. Most journals publish "Directions to Authors" and if the paper is being prepared for publication, the style of the journal to which it is finally submitted should be followed. If a thesis is being prepared, the University may dictate many points of the style. In a term paper, the student himself may determine the style of his paper. The principal objective is uniformity and it makes little difference whether "kilogram," for example, is written out or abbreviated, but whichever form is chosen should be consistently followed throughout the paper. The same rule applies to the use of subheadings. One should have a carefully thought-out plan for designating

the different portions of the paper in such a way that the reader will be able to tell whether a certain section is a different aspect of what has gone before or whether it is an entirely new line of thought.

The handling of the bibliography is a task which may also prove cumbersome. Bibliographies are usually written as a list at the end of the paper where each reference is given a number which corresponds to the number placed in parenthesis following the author's name in the text. Footnotes are seldom used in scientific work. The best procedure is to write the paper paying no attention to the numbering of the bibliography. When the paper is completed the bibliography, if it is a large one, is arranged alphabetically according to authors and numbered consecutively. Then the paper is gone over and each time an author is mentioned, his name is looked up in the alphabetical file and the proper number placed in parenthesis following his name. If the bibliograhy is a short one, the numbering may begin with "one" for the first reference in the paper with each reference following consecutively. This is difficult if the paper is long and the references many, because the same author may be referred to several times. The numbering is done before the final copy of the paper is made, and the bibliography typed from the cards. This eliminates errors and avoids typing the difficult bibliography more than once.

THE THESIS

When a literature search is made for the purpose of doing research to be presented in a thesis for an advanced degree, it should be completed before any actual laboratory work is begun, and during the progress of the work, special attention must be paid as stated above to current developments in the field. When the research is completed, the portions of the thesis which are concerned with the introduction and historical resume can be written largely as described above.

The survey of the literature for a research problem differs somewhat from that done for a term paper in that it should be broader. If one is, for example, to investigate some phase of tolerance to caffeine, it is important not only to know everything that has been done on this aspect of the

pharmacology of caffeine, but one must also know pretty thoroughly the general pharmacology of caffeine, and also of the purine compounds. This is necessary for a thorough perspective in order to give one the background from which to get original ideas which are the essence of research. Furthermore if the work is done for a degree, at his examinations the student will be expected to have a broad general knowledge of his field.

PUBLICATIONS

When original work grows out of a literature search and this is to be used as partial fulfillment for an advanced degree, it is presented to the faculty of the University in the form of a thesis. In earlier times this thesis was published in the same form as it was presented to the faculty. But today this is seldom done unless it is privately published. The reason is that a thesis in order to properly review the literature, and to develop all aspects of the research, must necessarily be lengthy, and no journal could undertake the expense of its publication. Thus when the work published as a thesis eventually appears in print, it is considerably less bulky than the original thesis. This has led to the conception which is unfortunately widely prevalent that a thesis is "padded" and indeed many theses written with this conception in mind are padded, usually with such inelegance that bulges appear at inappropriate places. Some directors of research have become so weary of this that they have insisted that the thesis be reduced to a very minimum.

Much of this has grown out of a misconception of the purpose of a thesis. It has the twofold purpose of familiarizing the student with the literature and in training him to write scientifically and lucidly. Both of these objectives are forestalled if the student approaches the task of thesis writing with the conception that it must be padded in order to have impressive bulk.

The reason for the reduction in size of the publication from the thesis is based entirely upon expense and mechanical consideration and it is unfortunate that entire theses cannot be published, but things being as they are, the problem of putting the research embodied in the thesis into a form

suitable for publication must be met. This cannot be done simply cutting out certain portions of the thesis. To do so is bound to result in a disconnected illogical paper. The paper must be a separate project written from a different standpoint and with an understanding of the editor's problems. Foremost among these are space limitations and the costs of illustrations and tables. It is frequently easy and simple to incorporate many tables or graphs in a thesis but the cost of their printing would be prohibitive in a journal. In the same way, one can develop a point at length in a thesis because space is unlimited. Fortunately when writing for publication one is writing for a very limited and specialized group of readers. Furthermore much greater dependence may be placed in references. For example, if one has used the "Epinephrine Reversal Method" for measuring the potency of one of the ergot alkaloids it would be advisable in a thesis to refer to the paper of Broom and Clark, the originators of the method, and describe its salient features. In a published paper a simple sentence stating that the epinephrine reversal method of Broom and Clark was used with the reference is sufficient. The resumé of the literature in a paper is also limited to only the work which has a direct bearing on the research being reported whereas, in a thesis this background is much more extensive.

In this process of concentration care should be taken to eliminate none of the essentials. Be sure that there is sufficient information so that the work can be duplicated. Often the writer is so close to his work that he omits many details of importance, and when a stranger comes to check his work or use his methods, difficulties arise. One must also be sure that all important data have been presented. Tables and graphs should be summaries if possible. In a thesis the protocols of each animal may be presented but in the paper each animal may appear only as a line in a table or as a point on a graph.

It will thus be seen that actually the thesis and the publication are two separate pieces of work designed for different purposes and if these differences be kept in mind as each is written, no conflict will arise between them.

ABSTRACT OF DISCUSSION

Professor Bonisteel asked if there is a publication which sums up the literature of pharmacology as Biological Abstracts does in its field.

To Dr. Dille's reply in the negative, Dr. Christensen added that a good many abstracts of articles pertaining to pharmacology appear in Squibb's Abstracts; the Journal of Pharmacology and Experimental Therapeutics and occasionally the Journal of the American Medical Association have reviews of current problems on pharmacology.

Experimental Pharmacology as a Teaching Tool*

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Dealing with the response of living units to drugs and medicines, pharmacology has a very definite and highly important objective. It must learn to understand life, and aspire to assist in the regulation of its mechanism, throughout its operation under all sorts of influences or conditions.

Thus pharmacology cannot help but be experimental. As it establishes the factors involved in the concrete relation between causes and effects, it places a yardstick of value on substances which may be found to be beneficial, harmful or inert to the living organism.

Pharmaceutical teaching will gain much by developing and using to its fullest extent a tool of such a dynamic force as experimental pharmacology may well be. As the teaching of experimental pharmacology, and particularly of the evaluation of drugs (bioassays), has been generally much neglected at medical schools, a great opportunity is before us in pharmacy colleges.

In a recent discussion of Pharmacologic Research, Dr. Hans Molitor (see Merck Report)[1] enumerated these three principal divisions of applied pharmacology:

1. Therapeutic research, the investigation of better methods of the medicinal treatment of disease.
2. Research in biologic standardization, the exact evaluation of the potency of drugs.
3. Toxicologic research, either in the field of preventive medicine or as forensic toxicology.

The United States Pharmacopoeial Committee, acknowledgly has been a pioneer in introducing biological methods of evalua-

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*Read before the Conference of Teachers of Pharmacognosy and Pharmacology, New York City, Aug. 16, 1937.

**From the Gross Laboratory for Biological and Biochemical Research.

tion as official bioassay methods. Leading American manufacturers of biologicals and pharmaceuticals and government laboratories have for decades employed workers in pharmacological control and research. The only comprehensive survey of experimental pharmacology, as far as we know, is that of Heffter and Heubner.[2] In addition we have the stimulating books on pharmacological methods, e. g., by Burn,[3, 4] Clark[5] or Sollmann and Hanzlik[6] and the extensive record of "Bioassays" by Munch[7] who recently published also a laboratory manual.[8]

While pharmacologic research has experimented in vitro, on isolated organs, on organ groups in situ, its most valuable work has or will be done on intact animals. Most impressive in its conclusiveness of results has been the biochemical vitamin work with controlled strains of rats, causing a food deficiency—by feeding diet lacking a specific vitamin—and then supplying it subsequently for recovery from the striking deficiency symptoms. Here the evidence of effects due to specific causes is fairly complete and so convincing that this type of experimental work has been introduced into classes where food chemistry, or biochemistry and biology are taught and even in the lower grades of public schools where the importance of adequate food is emphasized.

It is now generally admitted that all life, including the human, is subject to the same biological laws. The author and associates, most recently Dr. I. Cohen, have shown that no fundamental physiological differences exist between the invertebrates and vertebrates.[9, 10, 11] We thus may choose among the less complex animals those that respond alike with the organs and tissues of the three essential systems, muscular, glandular and nervous systems.

The author has selected a transparent crustacean, Daphnia magna, for a biological reagent.[10] Its standardization has given us a most welcome array of equal units for demonstration and research.

No typical substance, representative of physiologically active and thus pharmacological groups, has failed to produce specific effects and the scope, enumerated in the survey of Daphnia—the biological reagent, has been further widened.

Of hypnotic substances, chloral hydrate, barbiturate and methyl sulphonal have been tried in their depressing effects on organ functions and especially respiration and heart action.

The preliminary results, already obtained with the assistance of Dr. I. Cohen, are gratifying.

Of alkaloids, the work on strychnine has been much extended in the recently published study of the mechanism of strychnine action and the physiological evaluation.[11]* Brucine has been found to be much less toxic than strychnine, causing paralysis rather than convulsion. Morphine, as shown in preliminary experiments carried out with Mr. Robert Gilbert, causes rapid depression of organ function and especially the respiration and characteristic twitching of swimming organs, observable within 3 minutes in 1% solution of morphine sulphate.

Of irritants the work of cantharidin[10] has been extended; it has been shown that it is definitely unsuitable as a laxative as it is mainly locally active as a destructive agent. Elaterin was found a suitable substance, serving as a reference standard for organic laxatives.[12, 13]

Vitamin E speeded up (several days) the release of eggs from the ovaries as embryos into the broodsac.

It is obvious that these results were but the outcome of extensive experimentation in breeding, application and recording. As a result, methods were worked out permitting qualitative and quantitative observations with a high degree of accuracy.

Thus a sound foundation is laid for the introduction of a laboratory course in experimental pharmacology. The costs for experimental animals and apparatus is so low that even departments without special budgets can undertake it.

The visibility of cause and effect through the transparency of organs is so obvious that a knowledge of their working mechanism is quickly acquired. The number of uniform standardized animals, steadily available, can be increased at will so that vigorous mature animals may be bred in any number needed, practically from week to week.

Those who have the funds, the staff, and the opportunity may want to expand their experiments to the use of the common vertebrate, but more complex laboratory animals. In one institution, which this author visited some years

*A novel method, permitting wide application, has been introduced, using the alternate depression and recovery of the normal heartbeat and respiratory rate as a means of comparing preparations of unknown strength.

ago, animal experimentation was taboo due to the decision of the then acting dean of pharmacy.

While the author, (after more than ten years of experimentation), is convinced of the merits for the increased adoption of daphnia as an experimental animal, (see Cardinal Points in Favor of Daphnia,[14]) experiments are continuously carried on in our Gross Research Laboratory with vertebrate animals. This is done, mainly, for the purpose of checks of standardization as far as possible, and of tests suggested for bioassays and other phases of experimental pharmacology—as poisons and effective counter-agents.

So many problems await solution, as potentiation of medicinal action; the replacement of habit forming drugs as morphine; the discovery of efficient and specific antidotes for poisons; the isolation and preparation of the most efficient preparations and active substances; the most effective method of application; the judgment and control of drug value, etc.

It has been stated (1929-by Braun, Pharm. Ztg., N:1) that pharmacy had its eyes closed to pharmacology for the last fifty years. While this statement is obviously exaggerated we must now make every effort to see to it that, particularly, the younger generation of pharmacists appreciate the full importance of pharmacology and biochemistry, the least developed branches of physiology and chemistry. What better method could we use than to supplement or to replace mere descriptive teaching with applied experimental pharmacology. We should use this applied science as a tool, opening with it the sealed mind of the students for the understanding of life, especially as influenced and benefited by drug action, or harmed by poisons.

With an orientation in the maze of life, and drug function as a guide, increased intelligent care can be given to the preparation, selection, and handling of worthy medicines on the part of the pharmacist. Medicine will hail this progress.

The workers capable of contributing to the safeguarding control of our drug supplies or to the actual advance of knowledge by carrying out research in experimental pharmacology, may be recruited, we trust, largely from students in pharmacy.

It has been our happy experience that students, both undergraduate and graduate, can be readily inspired and

encouraged by the results obtainable upon experiments with animals, (especially if transparent as Daphnia). We, therefore, urgently advocate experimental pharmacology as a valuable teaching tool and as a powerful weapon for medical and pharmaceutical progress.

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ABSTRACT OF DISCUSSION

After concluding his paper, Dr. Viehoever showed some records illustrative of the action of certain drugs on animals and discussed especially the use of daphnia as an experimental animal. It permits the fundamental observation of drug effects; it permits the fundamental observation of life factors. Dr. Dille expressed doubt that daphnia have an autonomic nervous system. If they do not they are not universal in application and cannot be used in teaching students about autonomic drugs.

Objective Tests in Pharmacognosy and Pharmacology*

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During the past few years professional schools and professional education have been subjects of careful scrutiny and close study. As a result it has become evident that there are some aspects of professional education that should be considerably improved.

In the case of Pharmacy it has become evident that there is a very definite need for (1) measures which would serve as a sound basis for proper selection of students, and (2) measures which would serve in the proper guidance and development of students preparing for this profession. It would appear from this that what Pharmacy actually needs are: first, predictive tests by means of which Colleges may be able to properly select students who are, on the basis of character, ability and general aptitude, adapted for the profession of pharmacy; second, achievement tests by means of which Colleges may properly measure progress and accomplishment of students. Such tests may be carried out through objective examinations or comprehensive examinations or both.

Some other fields of professional education have already worked out selective and achievement tests and have been attempting to use them for the purposes set forth above. However, they have failed to get satisfactory correlation between predictive and achievement tests. It is claimed this is due to the fact that they have no valid means of measuring achievement. Hence, pharmaceutical educators who have given this subject some thought and study are of the opinion that it would be advisable for Pharmacy to first make a study of achievement tests in order to have a basis for setting up and validating predictive tests which could be worked out later.

In order to set up comprehensive examinations a basic and representative pharmaceutical curriculum appears advisable, if not necessary. Such a curriculum should cover the

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*Read before the Conference of Teachers of Pharmacognosy and Pharmacology, New York City, August 16, 1937.

fundamental fields of pharmaceutical education and it has been proposed that these be designated as follows:

I. Pharmacy
  A. Beginning (General)
    1. Elementary Pharmaceutical Principles and Processes
    2. Elementary Pharmaceutical Technique (Operative Pharmacy)
    3. Pharmaceutical Arithmetic
    4. Pharmaceutical Nomenclature
  B. Advanced
    1. Manufacturing Pharmacy (Small Scale Production)
    2. Pharmaceutical History
    3. Pharmaceutical Literature
    4. Commercial Pharmacy
  C. Dispensing
    1. Prescription Practice
    2. Incompatibilities
    3. Jurisprudence
II. Chemistry
  A. Beginning (General) Chemistry
  B. Inorganic Qualitative Analysis
  C. Inorganic Quantitative Analysis
  D. Organic Chemistry
  E. Biochemistry
  F. Drug Assay
III. Pharmacognosy
  A. Beginning (General) Botany
  B. General and Microscopic Pharmacognosy
  C. Microscopic Pharmacognosy
IV. Pharmacology
  A. Biology and Physiology
  B. Bacteriology
  C. General Pharmacology
    1. Pharmacodynamics
    2. Therapeutics
    3. Toxicology
    4. Posology
    5. Biologic Standardization
  D. Principles of Biologicals

This curriculum represents four general aspects of the field of Pharmacy to be studied with reference to objectives and achievement tests. This proposal is based largely on the contents of the Charters' Report and the National Pharmaceutical Syllabus.

Following the adoption of a curriculum, it would be **essential to set up the objectives of each course** in the curriculum. On the basis of definite units of objectives, objective examinations should be set up and on the basis of combined or

total objectives of a course or field, comprehensive examinations should be formulated.

With this brief introduction, we may now turn to the specific subject of this paper, namely, "Objective Tests in Pharmacognosy and Pharmacology." You will note from the above that Pharmacognosy includes three subdivisions, namely, A. General Botany, which may be considered beginning pharmacognosy or a foundation for pharmacognosy; B. General and Macroscopic Pharmacognosy; C. Microscopic Pharmacognosy. According to previous explanation it would be necessary for each College to organize courses to include as much of each of A, B and C as deemed necessary or possible. In order to cover the work in any course adequately and to intelligently examine students in the work covered it is essential that the instructor be thoroughly conscious of the objectives which he wishes the students to attain. This means that the instructor must have in mind, and probably on paper also, a detailed outline of the subject matter he expects to cover, what points are to be emphasized and a minimum of accomplishment below which the achievement of students will be considered unsatisfactory. The formulation of objectives and the preparation of objective examinations would obviously compel closer attention of instructors to the material and ground to be covered in each course, and this inevitably would result in improved teaching.

In preparing such objectives for General and Macroscopic Pharmacognosy and Microscopic Pharmacognosy Charters' Report and the Pharmaceutical Syllabus could be used to good advantage. As a matter of fact the outlines in the Syllabus are fundamentally objectives and could be used effectively as such. These outlines may also be used as a basis for the formulation of objective examinations. Examinations may be held as frequently as deemed advisable and as logically determined by the outline of the subject matter of the course. Comprehensive examinations covering the objectives of a course may be held at the completion of the course, whereas comprehensive examinations covering the objectives of a field such as Pharmacognosy may be held when the last course offered in that field is completed or at the close of the Senior year.

With reference to Pharmacology the same general prin-

ciples as outlined above also apply. The objectives may be formulated on the basis of the Charters' Report and the Pharmaceutical Syllabus. As a matter of fact, the outline of Pharmacology in the Syllabus might well serve as objectives and selections made therefrom on the basis of needs and possibilities of the individual college.

In addition to the advantages already mentioned, it is evident that such a plan as above outlined would result in definitely improved instruction in Pharmacognosy and Pharmacology. The procedures discussed require considerable thought, study and initiative on the part of the instructor. This necessary thought and study would inevitably result in a better and clearer understanding of the instructor of the end result desired and the intermediate steps to achieve that result. Again, such thought and study would undoubtedly result in the deletion of obsolete, irrelevant and dead material which is still included in some courses in this field. Further, such elimination would make it possible to include in these courses pertinent and live information of value in modern Pharmacognosy and Pharmacology.

To the student, it would offer something definite and certain in the way of necessary accomplishment. It would provide further a means according to which this accomplishment could be measured in a recognized and broad aspect rather than from the single opinion of the individual instructor. Again, in order to pass comprehensive examinations students would undoubtedly be required to review and summarize the content of all courses in both fields of Pharmacognosy and Pharmacology and thus encourage them to organize the subject matter in their minds in a correlated and systematic manner. Assuredly this would be a great improvement over the present situation.

In conclusion, it might be well to point out that a committee of the A. A. C. P. is already at work on this problem of measurement of achievement in Pharmaceutical education. It is hoped that every Pharmacognocist and Pharmacologist will cooperate with this committee in working out measurements that will accomplish the desired objective.

ABSTRACT OF DISCUSSION

Dr. Munch commended Dr. Christensen for the time and thought given to his paper and said it suggested that the Charters' Report and the Syllabus are not tombs but stepping stones to something up-to-date.

Dr. Lemon said he wished to reiterate his belief that our examination system is woefully inadequate. When studying the subject of objecives in his school they were surprised to find there was both duplication and omission. Attention of teachers was directed to the necessity of setting up objectives before a course can be properly taught or adequate examinations given. Though enthusiastic over the study of objectives and objective tests he feels much less interest in predictive tests. When it was first suggested that a committee be appointed to study the subject of predictive tests it was intended that they determine, among other things, the character of students that wish admission to colleges. That is a big job and it will be some time before predictive tests can be developed that will measure *character* but tests can be developed that will measure *characteristics* that we are looking for in prospective pharmacists. If money and cooperation are forthcoming perhaps in five years the Committee may have something worth while in predicting what a student will do as well as in the measurement of his achievements which is faulty now. The enterprise may seem nebulous now but if the Committee gets cooperation skeptics will be disillusioned.

Dr. Christensen concluded the discussion by saying it is not necessary to have a standard curriculum but curricula need reorganization as to course content so that when a term is used it means the same thing to all.

Relationship of Botany and Pharmacognosy to Other Courses in Pharmacy*

WM. J. BONISTEEL

Professor of Botany and Pharmacognosy, Fordham University

Botany and pharmacognosy should be correlated more closely to other subjects in the pharmacy curriculum. Botany should be taught on a broad comprehensive scale with rigorous fundamental training in basic subject material. Revision of our botany courses may be necessary to accomplish this result. Many of you have no doubt had to answer the questionnaire of the Committee on the Teaching of Botany in Colleges and Universities appointed by the Council of the Botanical Society of America. This survey will give a cross sectional view of the teaching of botany.

Dean Little in the May issue of the Journal A. Ph. A. calls attention to our lack of organization. I want to venture another viewpoint and that is our lack of correla-

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tion in the entire pharmacy course. We see the lack of this element in many ways. For example in a recent examination (not in a pharmacy school but largely concerned with pharmacists) words such as dialysis, percolation, bacteria, germination, and germicide were so poorly defined that the proportion of passes ran from three to forty per cent. While bacteria are plants and as such deserve at least some attention in botany, we feel that a brief description should place these entities in a proper classification. The answers lacked that precision expected of a scientifically trained man.

In another article entitled, "An Adventure in Pharmaceutical Curriculum Construction," Newton states that from a questionnaire sent out to pharmacy graduates replies indicated that certain subjects, such as biochemistry, should be stressed in our curricula. One subject which did not seem to be desirable was pharmacognosy. In this article in a proposed curriculum botany was to have three semester hours credit for one semester. In other words the poor student did not have enough material to even start pharmacognosy. If it takes a gallon of gasoline to go thirteen miles it will take three gallons to go thirty-nine miles. Now power suggests physics. In that same curriculum we find several courses in chemistry. For that we are grateful but how can you keep chemistry going without physics? Physics is not mentioned in that system except as an elective and then the courses are suggested for the fourth year. Certainly here is an obvious lack of correlation in subject organization and naturally the student suffers.

In one pharmacy text book it states that protoplasm is homogeneous. How can a student have vision or breadth of understanding with such information? Everything is dead before we even start. From another curriculum the use of the microscope is to be taught in bacteriology which was given as a third year subject. Certainly microscopic work in botany and pharmacognosy would be worthless. Was this an error in judgment? Certainly a lack of correlation.

Much can be learned from example. Yet in our pharmaceutical texts dealing with botanical subjects we find horrible examples of drawings. Cell walls are merely circles with many a segment missing. Yet if protoplasm is homogeneous perhaps we do not even need cell walls. In a heterogeneous

polyphase collodial system cell walls and membranes must be perfect.

More correlation is needed between our botanical subject matter and the United States Pharmacopoeia and the National Formulary. Every student should have access to both volumes. In Pharmacognosy there are ponderous volumes for text books. This material represents about 75 per cent of material copied from the official volumes. Why not a small text book and the official volumes for reference? Even in other fields of pharmacy we find virtually the entire book a copy of the Pharmacopoeia and the Formulary. Comments on these books are needed—not a reprint. We need books but let us have something worth while, not just a re-hash of something worth while and spoiled by its condensation. Many of our text books in pharmacy do not measure up to a high educational standard.

Needless repetition causes a great waste of time. In teaching the cell, based upon textbooks and courses given in several colleges of pharmacy, we find that material on the cell appears in botany, pharmacognosy, physiology, zoology, biochemistry, bacteriology, pharmacology, toxicology, and in public health. Here is an answer to where the three or four thousand hours go—needless repetition. Essentially the purpose of pharmacy is to dispense medicine to heal or cure the sick cells. Is it asking too much to know something about cells? The cell deserves much more attention than we now give to it. The botany course is the place to give the broad view point. All the reactions of cells can be shown or demonstrated. Here the effects of different solutions can be shown. The outstanding work of Dr. Chambers and the micro manipulator has been the classic cell work of this day. Manufacturing pharmaceutical companies carry on cell studies at Woods Hole. For publicity—certainly not—but to learn how cells react to different conditions. So I suggest more emphasis be placed upon the living cell in the botany courses. Correlate this work with all the other courses in the curriculum. The staminal hairs of **Tradescantia** offer excellent material for motility of protoplasm. The granules enable the streaming movements of cytoplasm to be readily seen. You need not have a greenhouse to grow this plant. Plasmolysis can be demonstrated by the common beet. In fact the rise of physical chemistry

is more or less directly traceable to such an incident. Add nutrient solutions to your plant and the newer ideas of nutrition are presented with the effect of minute minerals. Details need not concern us here since the standard procedures are in text books. Such a presentation gives the correct idea of the cell as a polyphase colloidal solution introduces its heterogeneous nature. The essential metabolic products of the plant in turn reflect upon all divisions of pharmacy. For it is in the physiology of the plant cell that vitamins were first built up. In the cell study many basic ideas can be taught, such as the idea of morphogenesis, or the basic work in the study of cellulose as it is carried on at the Boyce Thompson Institute of Botany.

Another viewpoint may strike you as a radical departure. It has been tried in a small way and has proved successful. It embodies certain elements already discussed. Let us take the first year botany course and replace it with a very thorough discussion of cells and their activities. Life processes are all in terms of cells. Build a new course around them entirely. True it would be a rigorous course but it would end endless repetition. The same idea carried into zoology would allow more time for new subject material. Even courses in a medical college could be broadened by this new course arrangement. For pharmacy students a modified course in botany would follow and pharmacognosy as the climax course.

In pharmacognosy our view point is very narrow. Plant breeding should be stressed. We need new and better strains of plants. Cinchona plant breeding gave increased yield of alkaloids. Aconite promises some similar responses. Even the possibility of new chemicals to be developed looms as an ever increasing possibility. Even now much has been done in that direction. New uses for economic plants are being continually found. Pharmacognosy hasn't contributed as much to cellulose knowledge as it should. Much now taught could be discarded as worthless.

Another suggestion is offered as a means of correlating. One period a week in each class might be devoted to a correlating hour in which the entire subject matter covered during the previous week is brought into one coherent unit. Such an hour might be termed a Dean's Hour, or it might be given to some other delegated authority. Naturally new

subject matter would not be taught but the value of each subject covered would be stressed as it relates to pharmacy as a whole. Preliminary tests have shown that such a scheme makes for pharmaceutical unity.

Rigorous fundamental training in basis subject material is needed. May we not reach that high point of intellectual honesty whereby we can readily train these students and give them something of that glorious vision that science offers. Truth with all that it implies and precision to guide them in whatever line of endeavor they pursue. For after all these students must live and adjust themselves in the world of today. They must be trained to be independent in thought and action.

ABSTRACT OF DISCUSSION

Dr. Viehoever pointed out that there is need for experimental material in animal and plant work which will demonstrate that life is never static. Search for a plant with a short life cycle has not been successful; search for a transparent plant has not been altogether satisfactory but plants can be grown and their life activity followed.

The Scope of the Pharmacognosy Course in Relation To Its Credit Value*

C. C. ALBERS

College of Pharmacy, University of Texas

All of those familiar with the history of education in the United States recognize that although the sciences were introduced into the university curricula in earnest during the early part of the last century, as courses in individual laboratory experimentation they did not come into their own until the middle of the century. At that time their value was recognized not only on the basis of course content but also on the basis of their value in formal discipline.

At the beginning of the last quarter of the last century instruction in pharmaceutical subjects was introduced for the first time into the university curricula. Since that time pharmaceutical education in general has been assumed by

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many state universities as an added function. However, in assuming this new function, I think it can be said that the universities have placed certain restrictions or limitations on the pharmaceutical courses (and no doubt rightly so) as they did with many other specialized or technical courses in the curriculum. This is perhaps more especially true in the younger universities or younger pharmacy departments in the universities where pharmacy as a profession or the pharmacy courses as a whole are not so well known or recognized.

It is generally conceded that the pharmacy courses, along with many other technical courses, have no basic value to others than the specialist in these particular fields. In other words, the contents of the courses or their value in formal discipline have no appeal or merits to the general academic student. Hence in some universities the tendency by the authorities concerned has been to question the admission of the pharmacy courses as of university caliber at all. But in doing so they have tended to make the courses "heavy" in comparison with other general courses of equal credit value.

If the above statements apply to many pharmacy courses and technical courses in general, it appears to the writer that the general course in pharmacognosy constitutes an exception,—not only from the standpoint of its credit value, but also from its value in formal discipline. For purposes of comparison with other courses of equal credit value, the course in taxonomy is admirably suited. Both courses are ordinarily open to sophomores, carry a credit value of six semester hours, and have approximately the same number of lecture and laboratory hours per week, with the exception that the taxonomy course calls for more field trips. Now let us examine the contents of the two courses as emphasized in most of our universities. In taxonomy the primary objective is to bring the student to a realization that plants have certain characters that make for separation into definite groups, whether these be family or generic. The differentiation of the various species in these groups is perhaps secondary. To this end, from 200 to 300 species of plants are classified during the year and their identity established on sight. Usually also the origin of the scientific names receive some emphasis. In addition, there is usually some

time devoted to the evolutionary relationship of these larger groups.

In the pharmacognosy course, on the other hand, a much wider range of knowledge is required of the student. Instead of studying living plants, he is required to identify about 250 to 300 plant and animal drugs in the crude form. And whereas in taxonomy the identification of the plant species is a major requirement, the identification of the crude drug samples in pharmacognosy is only a very small portion of the requirements. The student is expected to know also the part of the plant or animal furnishing the drug, the scientific name (often with explanations), the habitat, common names, the manner by which the drug is obtained from the plant or animal, the commerce of the drug, its chemical constituents and medicinal or pharmaceutical uses, and finally the historical background of the drug. In connection with the general history of drugs, emphasis is placed on the utilitarian uses of plants by primitive man and the importance of these uses for food and medicines in the gradual development of the science of pure botany. And, finally, in those universities and schools which are fortunate enough to maintain a medicinal plant garden in conjunction with the pharmacognosy course, the student of pharmacy is also expected to identify the living plant which furnishes the commercial drug. This makes for greater interest in and appreciation of the study of the drug.

In the light of these numerous and varied aspects of pharmacognosy, it becomes at once apparent that the scope of the course is quite broad in relation to its credit value. It should for this reason not only have a wide appeal to the science student, but should also be accepted by the university whenever a natural science is required.

Photographic Equipment and Its Use in the Field of Pharmacognosy*

RICHARD W. ST. CLAIR
Massachusetts College of Pharmacy

Proficiency in histological pharmacognosy is to a great measure acquired through visual observation. This was apparently well recognized by Berg and some other authors of about the same period, as their very fine and carefully constructed drawings amply testify. However, some of the books published since 1900 have devoted more attention to the descriptive text and less to the quality of the illustrations. This is not alone true of Pharmacognosy textbooks, as many other scientific textbooks of the past 25 years have been very poorly illustrated.

This is a rather peculiar condition, for during this same period tremendous strides have been made in all phases of illustrative and reproduction work. The invention of the cheap kodak camera and the phrase "You push the button and we do the rest" has done more to extend the limits of photography than any other single factor since the time of Daguerre. The original process of Daguerre and the later processes of Fox-Talbot and Scott Archer, because of the involved technique, restricted photography to a limited group of earnest workers, but in spite of the difficulties their superb accomplishments are still admired. The simplification of photography has made it possible for us to advance beyond the limits of our predecessors and turn out remarkably fine work with much less effort than was needed when collodion or wet plates were in vogue. But in spite of the fact that we have been able to advance to new heights, this same simplification of photographic processes has resulted in literally millions of atrocious photographs taken by those who have no conception of the underlying principles of a single aspect of photography. The too literal observance of the phrase "You push the button and we do the rest" can never result in pictures of great artistic merit.

During the past seven years, we have been attempting at the Massachusetts College of Pharmacy to introduce as

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much art and composition as possible into our illustrations without, of course, sacrificing scientific accuracy. It is only quite recently that we have had any measure of success for our efforts. The difference between failure and success however is very slight, and the rules which we have developed to assure success are not only simple but self evident.

In order that pictures of artistic merit as well as scientific accuracy be obtained, some thought must be given to the material selected. If the problem is merely to illustrate a dicotyl bark, for example, a subject like Prunus Serotina should not be selected, as it is not possible to make perfect sections of this material and the results are bound to be disappointing from the standpoint of interest and composition. There are many other barks of just as great pharmacognic interest as Prunus Serotina which will yield photographs that will contain much more pictorial appeal. It is suggested that the laboratory technician and photographer be consulted when the material to be used is being chosen. After the material has been selected it is of the utmost importance that the sections be prepared by a competent technician. The preparation of slides which lend themselves to photography is a task which should be undertaken only by those well versed in this work. It is impossible for the photographer to rectify any mistakes which have been made during the preparation of the material. Unless perfect sections are furnished him it is impossible for the photographer to turn out perfect pictures. Although this is a very self evident premise it is nevertheless one which is very often overlooked. When material is observed visually the hand of the microscopist is constantly and unconsciously adjusting and readjusting the fine adjustments of the microscope in order to keep the cells under observation critically focused. It is a rare section that can be placed under the microscope, focused critically for one cell and have all other cells in the field equally sharp at the same time, and yet that is the condition which must exist if perfect photos are to be made.

One fault which authors commonly lament is the fact that the illustration does not emphasize the features which are of the greatest scientific importance. This is sometimes true when the illustrator is not told in advance what to emphasize or when an incompetent amateur is employed.

It is rarely true, however, when a competent biological or medical artist is employed. It is for this reason that author, technician, and photographer should work together throughout the project, and if commendable results are to be obtained each man must be an expert in his own field. It is our belief that if proper facilities, time, and talent are available, illustrations of great beauty and teaching value may be obtained, and also that if abundant and interesting illustrative material is used a greater interest will be shown by students in this subject. At the Massachusetts College of Pharmacy we commonly employ three cameras for this type of work. For the most critical work we use a 6½ x 8½ inch Zeiss Horizontal-Vertical Photomicrographic apparatus. This is about the last word in photomicrographic equipment and when used in conjunction with a large research stand fitted with apochromatic objectives we are able to turn out work which is perfect in every detail. In order to assure an absolutely flat field we have found the Homal type of eyepiece to be of great value. These are projection eyepieces which while useless for visual observation give images of great clarity on the ground glass. Most of the photographs which illustrate this article are contact prints made from negatives taken with this equipment. I know of no other equipment which has the versatility and ease of manipulation embodied in this machine.

For lantern slide work we have standardized on the 9 x 12 cm Zeiss Phoku outfit. This is a camera which fits into the tube of the miscroscope in place of the ocular. It takes a plate slightly larger than a lantern slide and thus allows some leaway in composing the picture on the lantern slide plate. For serial work we use the Contax Phoku outfit which takes 36 pictures on a single roll of film. This outfit has also proved very satisfactory for general work.

For gross specimens three cameras are employed, an 8 x 10 Eastman View camera with a convertable Protar lens is used almost exclusively for copy work. In the field either a 4 x 5 Series D Graflex or a Contax is used. For color work we have found Dufay to be the best process so far devised for our work. Kodachrome as yet is available only in 16 and 35 mm. film. Medical movies of operations have yielded superb results with Kodachrome, although still pictures taken with the miniature camera have been if anything un-

naturally brilliant. A lot of Dufay color transparencies have been taken with the Contax. These pictures are excellent and will stand enlargments up to 6 or 8 feet across and as the cost of the complete lantern slide is less than ten cents it is rather an economical method of obtaining colored pictures.

So many students find pharmacognosy uninteresting that it behooves those of us who are concerned with the teaching of this subject to see what can be done to stimulate student interest. A factor of great importance is the laboratory phase of the work. Students get the bulk of their knowledge from the material they actually handle and only a fraction from the lecture or recitation phase. If the student is to get the greatest benefit from his course not only must he see the histological preparations under his microscope but he must constantly consult charts, diagrams, etc., and have material explained by the microprojection of actual slides.

Hand drawn charts and lithographs are excellent but at times they are too good: being composite drawings of what should be present but seldom is. This is misleading to the student, as his sections seldom resemble the elaborate charts.

For large classes microprojection is an ideal type of demonstrating medium since the actual sections are projected onto a large screen so that all may see the exact location of the tissues being discussed at the same time. For smaller groups of individual study photographs are the nearest thing to microprojection, and if the photographs are good they make a very acceptable substitute.

ABSTRACT OF DISCUSSION

Dean Lemon inquired about the amount of money a school would need to invest to get adequate equipment, and Mr. St. Clair said that his ran pretty close to $8,000, but that for ordinary work $300.00 to $1,000 should be adequate. Equipment should last almost indefinitely. If the very best is purchased in the first place there need be no replacement.

Reports of Committees at the 1937 Meeting

(Continued from the October, 1937 Number)

REPORT OF THE COMMITTEE ON FOOD AND DRUG LEGISLATION

The Committee has been active during the year but we are sorry to report that Senate Bill Five is still in the hands of the House Committee on Interstate and Foreign Commerce and probably no action will be taken upon it at this session of Congress.

The old question of whether the Food and Drug Administration or the Federal Trade Commission shall have charge of the enforcement of the advertising clauses of Senate Bill Five has again arisen. Dr. Copeland tried to settle the question by including the following in Senate Bill Five: "Nothing in this Act shall impair, or be construed to injure or diminish, the powers of the Federal Trade Commission under existing laws." Apparently this provision is not entirely satisfactory to some of our representatives as there has been a move in the House to pass legislation that will clarify and extend the powers of the Federal Trade Commission.

All of you know that the attention of this session of Congress has been given, in a great measure, to consideration of legislation for the reorganization of the Supreme Court and that little or no attention has been given in the House to food and drug legislation. This means that our hopes for favorable legislation on this important subject must be transferred to the next session of Congress.

However, this does not mean that we should not do all in our power to arouse a keener interest, on the part of the public, in food and drug legislation. Our Committee circularized the auxiliary committee, including a representation from every state, requesting that support to Senate Bill Five be urged upon members of the House of Representatives. Dean Rudd also circularized the deans of the American Association of Colleges of Pharmacy in a strong letter urging support of this legislation. He also wrote a strong editorial that appeared in the American Journal of Pharmaceutical Education.

Members of the staff of Purdue University School of Pharmacy continue to advocate such legislation before luncheon clubs, League of Women Voters, and doctors' and nurses'

associations. Dean Spease broadcasted over a Cleveland station, discussing this much needed legislation. Without doubt a number of members of our Association have added their "bit" to this effort, but it would take too much of your time to report all of these.

It is very evident that we will not secure a satisfactory food and drug law until public opinion is aroused to the point where Congress must take cognizance of it. We, of the American Association of Colleges of Pharmacy, should be crusaders in an effort to arouse public opinion and we should do all in our power to spread the gospel of needed food and drug legislation. If any member of our Association fails to take advantage of every opportunity or fails to secure opportunities to set forth the need of better food and drug legislation just so far our Association will fail to do its just duty toward this important progressive movement. May we urge upon all of you the need of cooperative aggressive effort toward this end.

Respectfully submitted,
C. B. Jordan, Chairman

REPORT OF THE COMMITTEE ON STATUS OF PHARMACISTS IN THE GOVERNMENT SERVICE

This Committee is not able to report such a spectacular accomplishment as it did at the meeting last year. It can, however, report steady progress during the year toward gaining its objectives, and that plans are being developed toward legislation placing pharmacy on a more satisfactory basis in the Navy.

In order that the pharmacists of the nation may more fully appreciate what has been accomplished during the last decade toward improving pharmaceutical service in, and toward securing a more satisfactory status for pharmacy and for pharmacists in the government service, the accomplishments, for which this Committee and its predecessors deserve only part of the credit, should be briefly reviewed. Ten years ago, pharmacy was still listed as a sub-profession; pharmacists were still classified solely in the sub-professional group, with only a few commissioned; and the schools and colleges of pharmacy were not included among other institutions of higher learning, in so far as the federal government

was officially concerned. Today, pharmacy is recognized fully as a profession; pharmacists are classified in the professional as well as the sub-professional groups under the Civil Service; pharmacists are commissioned in all three of the military services, the Army, Navy and Public Health Service; schools and colleges of pharmacy are listed as institutions of higher learning; and the American Association of Colleges of Pharmacy, the American Pharmaceutical Association, and the National Association of Boards of Pharmacy, which associations have cooperated in all of these accomplishments, are listed among the educational, civic and learned associations of the nation.

The successive steps were to secure recognition of our educational institutions and of our professional organizations; to have pharmacy and pharmacists classified in the professional and scientific group under the Civil Service; to obtain commissions for pharmacists in the Public Health Service and in the Army (they were already commissioned in the Navy); and to secure recognition of pharmacy as a profession under the codes and in connection with food and drug, narcotic, labor and other Federal legislation.

And while we may take satisfaction in what has been done during this period, and although these basic changes are the most difficult to bring about, the results only indicate what may be done in the future to improve and extend pharmaceutical service, and to open greater opportunities for well qualified pharmacists in the government services, state and municipal as well as national.

As an example, only a few pharmacists and all of them classified in the sub-professional group, were then employed in the Veterans Administration while now there are 106, of whom 92 are classified as professional and 14 as sub-professional, with a pharmacist of the professional rating in charge of the pharmacy in every veteran's hospital. As their work is extended into the laboratories and other services for which the graduates of the present course are qualified, this group of pharmacists can be further increased and advanced. A careful study of other governmental services in which pharmacists are eligible under the Civil Service, such as the Alcohol Administration, the Narcotic Bureau and others, will bring about similar satisfactory results.

Improvement and expansion are somewhat more difficult in the commissioned services because of the conditions and

forms of organization under which they must operate, although the results are even more encouraging.

The quota of 26 pharmacists in the Public Health Service, 10 of whom were commissioned under the Parker Bill, are being reasonably maintained and this number could be increased with improvement to the Service.

About 110 Chief Pharmacists are commissioned in the Navy and rank with but after an ensign, and 10 pharmacists are warrant officers. Although the pay of these groups is in advance of their rank, the situation is not satisfactory since they cannot advance beyond the rank of Chief Pharmacist to which pharmacists are eligible after 6 years of satisfactory service and passing an examination.

Eight vacancies existed when the legislation was enacted last year limiting commissions in the Medical Administrative Corps of the Army to pharmacists and an examination to fill them was held in Decmber. 64 of the applicants met the requirements and were admitted to the examinations. Of these, 41 failed the physical examination, 21 failed the other examinations and 2 passed all of the examinations. The latter were later commissioned as second lieutenants and stationed in general hospitals at San Francisco and Denver. It was expected that examinations to fill the 6 remaining and any vacancies that have occurred since that time, would be held in September of this year but under the recent economy order, they will not be held until December and possibly later.

Respectfully submitted by the Joint Committee,
Ernest E. Kendig, Chairman.

REPORT OF THE COMMITTEE ON THE STATUS OF WOMEN IN PHARMACY

This Committee was appointed through a recommendation of the Executive Committee of the American Association of Colleges of Pharmacy and a subsequent definite resolution by the membership present at the Dallas meeting.

The Committee followed the instructions indicated in the recommendation of the Executive Committee and studied the question from the following angles: First, the number of women entering pharmacy; second, the adaptability of

women in the profession of pharmacy; and third, what attitude should the Association take toward this question.

NUMBER OF WOMEN ENTERING ASSOCIATION COLLEGES

In the period from 1927 to 1936 inclusive (a ten year period), from 52 schools reporting, of which two schools do not admit women students and 6, which because of incomplete data could not be included, a total of 2094 women were admitted. Computing the total effective number entering all member schools by applying the average obtained through these returns gives a total number of 2618 women entering. In the same period 25,682 students entered the member colleges. Consequently the women entering member colleges constitute about 10 per cent of the total.

The number of women graduating from the 44 schools is 1124. Calculating an average for the others would give a total of 1405. The figures for graduates for the ten year period were not readily available. However, the total number of graduates for the five year period, 1932-36, inclusive was 7188. Assuming the average would have held for the ten year period the total graduates, 1927-36 inclusive, would have been 14376. From these figures it would appear that the number of women entering member colleges and also the number graduating would constitute about 10 per cent of the total number of students.

ADAPTABILITY OF WOMEN IN THE PROFESSION OF PHARMACY

Comments relative to the type of women entering pharmacy as well as to their adaptability for the various phases of work in the field would seem to indicate that in the opinion of the majority women are a distinct asset and serve an unique need.

WHAT ATTITUDE SHOULD THE ASSOCIATION TAKE?

On the question "What attitude should the Association take?" 52 replies were received, 11 favored taking a position. The majority of these felt women should be encouraged to enter the field while a few expressed some concern over the possibility of too many entering. 36 replies indicated that it was not the business of the association to take any position in the matter. 5 made no comment on the question.

CONCLUSION

Pharmacy desires to attract to it students of good character and of superior intelligence. Women of character and intelligence should and do add a necessary leaven to the group. May their ranks increase according to our need for them and their desire to join with the rest of us in advancing the ideals of pharmacy.

Respectfully submitted,
C. Leonard O'Connell,
Chairman.

REPORT OF THE COMMITTEE ON CURRICULUM AND TEACHING METHODS

The Committee of 1936 was instructed to conduct a study of existing pharmaceutical curricula to determine the possibility of developing what might be considered "the ideal course of study" for pharmacy students. The report of this committee embodied a summary of the replies obtained to three questions whch were pertinent to the issue and concluded that (1) it would be neither feasible nor logical to suggest the content for a complete ideal course in pharmacy, (2) much could be done toward the establishment of more basic requirements, (3) the principles of the Syllabus are in many cases not adhered to, and (4) finally recommended that a detailed inquiry be made as to what subjects each administrator and his staff felt should be taught in the colleges and the approximate number of hours that should be devoted to those subjects with the hope that the result would be a "clearer definition of the status of the Syllabus and an approximation of an ideal set of basic requirements".

The report of the 1937 Committee is, therefore, divided into two parts, that dealing with the specific study as recommended by the committee of last year, followed by indicated suggestions for the improvement of teaching and teaching methods in the colleges of the Association.

I. In order to accomplish its charge, the committee decided to learn to what extent the various colleges adhered to the **minimum** requirements of the Pharmaceutical Syllabus.

Accordingly a table representing a recapitulation of the subjects as offered on page 16 of the Fourth Edition was sent out to the member colleges requesting the following information (See Tables I and II): (A) in column I a statement of the approximate number of hours that should properly be devoted to the subject designated, (B) in column II the appropriate year or years the subject should be offered, also (C) subjects that should be deleted, or changed from optional to required subjects or vice versa, (D) changes in titles, and (E) new courses that should be offered in order to modernize our curricula.

The results of this survey are enumerated as briefly as possible in the table which has been distributed and represents averages of the mass of data that was collected. Time does not permit an elaborate discussion of the data and comments received but the following observations and conclusions may be stated:

(1). In so far as the majority of the subject matter is concerned the Syllabus does serve as a valuable guide to curriculum building.

(2). Variations in course titles and hours for the same in many cases are due to a confusion arising from the titles and aims of some of the courses in the present Syllabus. This is especially true of the purposes of the courses in pharmaceutical chemistry, pharmacology and in such titles as manufacturing, operative pharmacy, pharmaceutical technique and theory of pharmacy.

(3). From the material submitted, the figures in column I represent the approximate **minimum** clock hours in which a subject might be offered and still be dignified by a course title. From the tendered suggestions—especially for the basic subjects—it is observed that the colleges connected with state institutions offered courses with greater variations in clock hours than the independent schools, the latter, in most cases, having adhered closely to Syllabus requirements.

(4). Column II represents the year or years in which the courses should most logically be offered, based on the majority of replies.

(5). Comments indicated that there is a need of presenting in the field of organic pharmaceutical chemistry a broader knowledge of the synthesis of new medicinals and

that another course be required in the form of a rapid survey to acquaint the senior in pharmacy with new ethical preparations including recently introduced synthetics, vitamins, biological and glandular products and the therapeutic foundations for their uses.

(6). The following list constitutes some of the elective subjects that were suggested in the replies:

Biology	Philosophy
First aid	Plant histology
Government	Public speaking
Lettering and window display	Scientific german
Milk analysis	Sociology
Physical chemistry	Toxicology
Psychology	Urinalysis
Professional and hospital work	Water analysis

A detailed discussion of these observations would be time-consuming and it is recommended that all of the above outlined suggestions be referred to the Syllabus Committee for its consideration.

II. The Committee feels that the Association should not only be interested in curricular matters and teaching methods but also in conditions which tend to retard or improve our educational progress. Little has been said of such matters in past reports and the following considerations are submitted for serious thought on the part of the Association.

A. The tendency has existed in our colleges of pharmacy to load the curriculum with courses so that almost all of the student's time will be accounted for in classes during the day and in study and notebook preparation at night, and allowing no room for extra-curricular activities. It is a debatable question, perhaps, whether our students of pharmacy might not benefit more if the required course of study was adjusted to permit more participation in extra-curricular activities of various sorts. Some hold that the professional schools in general demand more rigid and more heavily weighted curricula and point to the requirements of medical, dental and law schools as examples. In these cases, the students have had opportunity during their pre-professional courses to participate and gain the advantages of such activities. There is evidence of some utilization in this respect of the curriculum in some of our schools of

pharmacy but it is the opinion of the Committee that the administrative officers of each college should endeavor to encourage rather than discourage students taking part in extra-curricular activities, making a fair allowance for the same and adjusting the credit requirements to a basis more in semblance to that of the arts and sciences. A study of this condition is recommended.

B. The committee feels that the work of the Committee on Predictive and Achievement Tests should be given proper encouragement and that it be requested to include as part of its commission an early inauguration of aptitude tests for persons desiring to be admitted to courses in pharmacy.

C. As important to good pedagogy the committee wishes to emphasize the value of an adequate amount of recitations, discussions or conferences with students and frequent written tests as supplementary to formal lectures. It is especially recommended that a liberal time allowance be permitted for conferences with students.

D. It is felt that the vision of Pharmacy Schools and their staffs can be substantially broadened by discouraging excessive "inbreeding" and encouraging an adequate system of exchange professorships and leaves of absence, thereby permitting further study and investigation by the staff members.

E. It is believed that one of the factors most conducive to good teaching is a harmonious relationship between the staff and the administration of the school and that such a relationship may be greatly enhanced by having regularly scheduled staff meetings at which the dean and the staff may consult and share with each other in mutual understanding the duties and problems confronting the school.

Since it is known that certain conditions do exist, the committee believes the following points should be referred to the American ouncil on Pharmaceutical Education to be considered in formulating the proper standards for the improvement of pharmaceutical instruction in general.

a. The occurrence of burdening the instructional staff with excessive teaching loads as well as with clerical and mechanical tasks. It is felt that much of the latter can be more economically accomplished by truly departmental secretaries or stenographers and by proper stockroom assistance. For further discussions of these conditions reference may be made to the

reports of Committee U of the American Association of University Professors.

b. Since it is exceedingly detrimental to efficient teaching, the elimination of the practice of requesting a staff member to instruct in two or more recognized fields instead of proper specialization in a single field is highly desirable.

e. Elimination of all courses for credit which tend to be "review or cram courses" for state board examinations is recommended.

d. New appointments to a Pharmacy Staff should be made only to individuals who have had a basic undergraduate training in pharmacy as well as graduate training, or its equivalent in experience in the fields in which they are teaching.

e. Accreditment of schools offering graduate degrees in Pharmacy with the requirement that no degree of an advanced character should be granted to individuals without undergraduate pharmaceutical training is proposed for consideration.

The matters briefly mentioned in Part II of this report have been given serious consideration by the Committee and are offered for your deepest thought and possible further study by the Association.

Respectfully submitted,

Henry M. Burlage, Chairman.

TABLE I

(List the subjects and clock hours devoted to each as indicated below.)
D = Didactic hours T = Total hours
L = Laboratory hours *Optional Subjects

National Syllabus—Subjects and Hours	BASIC SUBJECTS D	L	T	Column I D	L	T	Column II Appropriate Years to be Offered
*Bacteriology (General)	Make a required subject			48	64	112	3rd or 4th
Botany	48	64	128	Syllobus hours too high?			1st
Chemistry	Syllabus hours too low						
General	48	64	112	64	64	128	1st
Organic	96	128	224	No change			2nd (3rd)
Qualitative	48	64	112	Decrease didactic hours Increase Laboratory hours			1st or 2nd
Quantitative	32	64	96	Minimum requirement too low 32	96	128	2nd or 3rd
Economics	96		96	No change			(2nd) 3rd
English	96		96	No change			1st
*French or German	96		96	No change			Any year
Mathematics	96		96	No change			1st
Physics	64	128	192	Syllabus requirement too high		160	2nd or 3rd
Physiology	48	48	96	No change			(2nd) 3rd
*Zoology	32	64	96	No change			1st or 2nd

TABLE II

PROFESSIONAL AND APPLIED SUBJECTS

National Syllabus—Subjects and Hours	Column I						Column II
	D	L	T	D	L	T	Appropriate Years to be Offered
*Accounting	Change to optional subject Hours too high 32	64	96	48 to 64			2nd or 3rd
Applied Bacteriology	Change to optional subjects; Hours too low if substitute for Gen. Bacteriology 32	64	96	48	64	112	3rd or 4th
*Biological Assaying	16	48	64	No change			4th year elective or graduate course
*Insecticides, etc.	Delete and offer on other courses; hours too high? 32		32	16		16	3rd or 4th
*Merchandising, Advertising, and salesmanship	Change to required subject 64	64	128	32	64	96	3rd or 4th
Pharmaceutical Chemistry							
*Bio-Chemistry	48	64	112	Change to required subject Hours same			4th
*Inorganic	32	64	96	No change			2nd or 3rd
*Organic	Expand to include synthetical medicinals; required 48	64	112	48	96	144	3rd or 4th
Quantitative	48	64	112	No change			3rd or 4th
Pharmacy							
Arithmetic of Pharmacy	Some feel that this subject should be included in Theory of Pharmacy 32		32				1st
Dispensing Pharmacy	64	128	192	Increase hours (?)			3rd or 4th
History of Pharmacy	32		32	No change			1st (other yrs.)
Pharmaceutical Jurisprudence	Include in other subjects (?) 32		32	16		16	(3rd) 4th)
Latin of Pharmacy	Tendency to delete and include in other courses 32		32				1st
*Manufacturing Pharmacy		96	Offer didactic work 96			96	3rd or 4th
Operative Pharmacy	64	128	192	No change			2nd (3rd)
Pharmaceutical Technique		64	64	32	64	96	1st

Table II—Continued

Theory of Pharmacy	192		192	Distribute over operative Pharmacy and pharmaceutical technique			1st, 2nd, 3rd
Pharmacognosy, Gen. and Macrosc.	64	64	128	No change			2nd (3rd)
Pharmacognosy, Microscopic	16	Some feel this might be in General Pharmacognosy or optional. No change 64	80				2nd (3rd)
Pharmacology	96	32	128	Hours too high			3rd or 4th
Public Health Studies	48	Change to optional	48	32	0	32	4th

REPORT OF THE SYLLABUS COMMITTEE

At the Dallas meeting of the Syllabus Committee the writer was permitted to relinquish revision duties during his leave of absence and the members appointed Dr. H. M. Burlage as acting chairman of the Committee. He will present his report in conjunction with this one.

A year ago a cash balance of $502.45 was reported. Receipts of $100 from the American Association of Colleges of Pharmacy and $50 from the American Pharmaceutical Association have recently come in. Expenditures of $20 for the luncheon meeting last year and $3.98 for miscellaneous items leave a cash balance of $478.47. Of the original sum ($502.45) I turned over to acting chairman Burlage for his uses.

With real reluctance I shall present my formal resignation as Syllabus Chairman at the luncheon meeting of the Committee in New York on August 18. All members were notified of this fact on July 14 in order that deliberate thought could be given to the choice of a new chairman. As I relinquish my duties permanently and render this final report I wish to thank the organizations and the individuals who have on the one hand imposed confidence in my ability and on the other hand have given generously of time and

energy in the work involved during my administration as chairman. May my successor receive the same full measure of co-operation.

Respectfully submitted,
J. G. Beard, Chairman.
Chapel Hill, N. C.,
November 13, 1937.

To the Members of the Syllabus Committee:

On November first I turned over to Chairman Burlage the following report of the financial affairs of Syllabus work and received a receipt from him for the cash balance on hand:

I am submitting my final report as retiring chairman of the Syllabus Committee.

RECEIPTS

Cash Balance on hand, August, 1936	$502.45
Donation from American Association of Colleges of Pharmacy	100.00
Donation from American Pharmaceutical Association	50.00
Donation from National Association of Boards of Pharmacy	50.00
	$702.45

DISBURSEMENTS

Luncheon meeting in Dallas, 1936	$ 20.00
Advanced to acting chairman Burlage	150.00
Freight charges on 500 unbound copies of Syllabus	3.98
Luncheon meeting in New York, 1937	17.00
	$190.98

BALANCE

$702.45 minus $190.98	$511.47

In relinquishing the chairmanship of the Syllabus Committee I want to take advantage of this opportunity first to solicit your cordial cooperation with the new chairman, and second to thank those of you who were on the Committee during my term in office for the gracious and helpful assistance you rendered to me. I have every reason to believe that the next revision will become a definite improvement over the last edition and I can wind up my job in no better way than to express the hope that the present Committee will accept personal responsibility in making this improvement possible.

Sincerely yours,
J. G. Beard.

REPORT OF THE ACTING CHAIRMAN NATIONAL PHARMACEUTICAL SYLLABUS COMMITTEE

Due to unforeseen circumstances the work of the Committee was delayed until January, 1937, at which time the

acting chairman assumed his duties and this portion of the report covers the activities accomplished since that time.

At the Dallas meeting the Committee decided, in compliance with the fact that the United States Pharmacopoeia XI and the National Formulary VI had become official, and because of changes occuring simultaneously with the advent of the four year requirement for graduation, that it seemed essential to undertake a revision of the Syllabus.

Accordingly the Chairman was instructed to solicit comments from interested individuals, especially those qualified in certain subjects, by sending outlines of these subjects from the stock of unbound copies of the Syllabus on hand. This work was undertaken by the acting chairman. Notices were published in the Journal of the American Pharmaceutical Association and the American Journal of Pharmaceutical Education inviting comments, letters were sent to each member of the Committee for suggestions as to procedure, and outlines were sent to more than two hundred and fifty persons. In the latter case the results have been most encouraging. Replies are still arriving and the responses indicate a surprisingly consentient interest in the Syllabus and constructive thought and suggestions for its revision, in spite of a belief to the contrary held by some individuals. These replies have been of such a character that when analyzed by the Committee should prove unusually helpful and are being turned over to the Committee which should make definite steps and procedures for the revision of the Syllabus at its meeting tomorrow.

The financial report of the acting chairman from January 1 to August 1 follows:

RECEIPTS		DISBURSEMENTS	
Received from Chairman Beard	$150.00	Postage and Supplies	$15.05
From sales of the Syllabus	20.00	Duplicating	12.97
		Clerical	33.55
Total	$170.00	Total	$61.57
	61.57		
Cash Balance	$108.43		

Respectfully submitted,
Henry M. Burlage, Acting Chairman.

EDITORIALS

Progress Through Cooperation

I have read with unusual interest the article "Leadership or Regimentation in Higher Education" by President Ruthven of the University of Michigan which appeared in the last number of the American Journal of Pharmaceutical Education.

Immediately following this article by Dr. Ruthven is one entitled "Modernization of Pharmacy Laws" by Dr. Robert L. Swain. This article is, in reality, a report of the committee on "Modernization of Pharmacy Laws" of the American Pharmaceutical Association. In my judgment, this report constitutes one of the most progressive, forward-looking reports which it has been my good fortune to read for some time.

I very much enjoyed Dr. Ruthven's article and am in hearty accord with the main text of its presentation. It seemed significant, however, that Dr. Ruthven's article should have been followed by such a splendid presentation written by a board of pharmacy member. Does it not indicate how careful we must be to seek consultation and advice from all possible sources before deciding fundamental policies pertaining to the operation of our colleges of pharmacy?

Wisdom and vision such as displayed in Dr. Swain's article as well as in an article by Dr. Robert P. Fischelis in the January 1938 number of the Scientific Monthly, should be most willingly received or if necessary, solicited. Nevertheless Dr. Ruthven's point is well taken that the final decision regarding educational policies should and must be in the hands of our colleges if a free unfettered system of education is to be maintained.

As we look back over the progress of the last twenty years, it is impressed upon us that much of the progress which we have enjoyed could not have been made except for the effective and proper cooperation of boards and colleges. The continuation of such cooperation will mean even greater progress in the days ahead.

Although it is folly to needlessly anticipate difficulties, it is equally unwise to assume that cordial, fruitful relationships will continue of their own momentum without careful courteous consideration from both parties.

Such consideration will, I believe, lead to the conclusion that there is a line of cleavage, none too sharp to be sure, between the responsibilities of boards and colleges beyond which we ought not go unless invited to do so.

We as educators should keep constantly in mind that boards of pharmacy are official bodies appointed by the governor of the state in which they are located and that their duties and responsibilities are imposed upon them by their respective legislatures. It is but natural that they should not discharge all of their responsibilities in a manner which seems to us to be the best method of procedure. In practically all states, boards of pharmacy and colleges of pharmacy do work closely and harmoniously in the discharge of their responsibilities. Board examinations are held in college buildings and there is sufficient contact to enable board members to make full use of college cooperation without in any way surrendering their legal responsibilities. Let us be tolerant in our viewpoints toward board of pharmacy operations. May we remain slow to criticize, quick to cooperate when such cooperation is desired, and determined always to stay on our own side of the fence except as we may be "invited to a party".

It is also gratifying that boards of pharmacy very generally realize that their responsibilities are to protect the profession of retail pharmacy by making certain that only safe individuals are given the certificate of registered pharmacist and thus admitted to the ranks of the profession.

This does not mean that board members should gradually take over the responsibilities of college executives and faculties to such an extent as to tell colleges whom to admit, what to teach, how to teach, whom to promote and whom to graduate.

I realize quite well that here again we have no sharp line of separation and that it is essential for boards of pharmacy to make short excursions into college territory in order to build up an approved list of colleges whose graduates may be permitted to take their qualifying examinations. The encouraging circumstance is that they do not, in most in-

stances, show a tendency to wander all over the college map simply because it was necessary to be admitted on minor excursions.

Boards of pharmacy have very properly decided that, within reason, the college should be left free to choose the kind of material with which they choose to work, that they should be largely unrestricted in drawing up a curriculum which their years of experience tell them is the most effective curriculum and that they should very properly be permitted to decide which individuals shall bear the name of their university and which ones shall not. Any other arrangement would amount to imposing certain responsibilities upon college faculties without giving them sufficient power and equipment to do their best work and meet their responsibilities as adequately as possible.

In regard to the decision as to which of these graduates may practice pharmacy, the opinion of the boards is, of course, final and irrevocable. This again is as it should be. Otherwise we would be imposing responsibility without adequate power to perform their best service.

I fully realize that the points stressed in this presentation are in no sense novel. However, it is sometimes helpful to review important well known facts.

I realize also, as hinted above, that boards of pharmacy have found it necessary in the past to lay down certain qualifications for colleges desiring their recognition. This, of necessity, involves minor encroachments upon the responsibilities of the colleges.

I am wondering if the American Council on Pharmaceutical Education may not be instrumental in removing even very minor sources of misunderstanding between boards and colleges. This accrediting body is made up of representatives of the American Pharmaceutical Association, the National Association of Boards of Pharmacy and the American Association of Colleges of Pharmacy. Its personnel is such as to command the respect and confidence of all of us. If board members and college faculties will throw their support solidly and completely back of our Council, it will establish a place for itself which will prove exceedingly helpful to both boards and colleges in the discharge of their responsibilities.

May we start the new year with the resolution to pursue our own responsibilities actively and aggressively, to cultivate

a spirit of tolerance toward the other fellow and his obligations, and to develop the American Council on Pharmaceutical Education to the point of its greatest usefulness.

Ernest Little.

The American Council on Pharmaceutical Education

The American Council on Pharmaceutical Education is a committee sponsored by the American Pharmaceutical Association, the National Association of Boards of Pharmacy, and the American Association of Colleges of Pharmacy. It was organized in 1932 and is a direct outgrowth of a survey committee created by the National Association of Boards of Pharmacy five years earlier.

In 1927, the National Association of Boards of Pharmacy appointed a committee to make a comprehensive survey of pharmacy for the purpose of obtaining information which might be used as the basis for establishing standards for colleges of pharmacy. This committee was designated the Pharmaceutical Survey Committee. In 1928, the American Association of Colleges of Pharmacy was tendered and accepted an invitation to join the National Association of Boards of Pharmacy in the furtherance of this survey project. Owing, however, to the difficulties experienced in raising the funds necessary to carry on the contemplated work, the project was abandoned and, in 1932, there was organized a new committee consisting of three representatives from each, the American Pharmaceutical Association, the National Association of Boards of Pharmacy, the American Association of Colleges of Pharmacy and one representative from the American Council on Education. The new committee was given the title of the American Council on Pharmaceutical Education, and a constitution and by-laws providing for its organization and the conduct of its business were drafted and approved by the constituent organizations.

The Council held its first meeting in Toronto, Canada, on August 26, 1932. Since then, it has held one or more meetings each year. Its activities up to the present time have been confined largely to the work incident to the drafting

of standards to be used in the accreditment of colleges of pharmacy.

The American Council on Pharmaceutical Education, as the foregoing historical statement makes clear, was established for the purpose of setting up an accrediting agency in pharmaceutical education comparable to similar bodies now functioning in medicine, law, dentistry, and other professional fields.

It is believed that the Council can, and will, exercise a constructive influence in raising the standards of pharmaceutical education as the desire to meet the requirements for accreditment will stimulate the colleges to improve their teaching facilities and to adhere more rigidly than heretofore to sound educational procedures. It is also believed that the work of the Council will be of great benefit to the examining boards as it will make available to them an authoritative list of the colleges of pharmacy of this country which conform to acceptable educational standards.

From the very beginning of the work of the Council, the American Assciation of Colleges of Pharmacy and the National Association of Boards of Pharmacy have been kept fully informed of the progress which was being made. Bulletins have been sent regularly to each of the sponsoring associations and annual reports have been made at the national conventions. Matters of specific importance were referred to the constituent groups on numerous occasions and, in the formulation of the standards for accreditment as finally adopted, due consideration was given to the criticisms and suggestions made by the individual boards and colleges.

It is, therefore, believed that the standards which the Council has set up represent the consensus of opinion of the groups most vitally concerned with maintaining pharmaceutical education on the soundest basis possible.

Now that the standards for accreditment have been officially approved, they have been sent to the several colleges of pharmacy, together with a form upon which to make application for accreditment. Accompanying the application was a questionnaire upon which the college requesting accreditment will furnish the detailed information which the Council requires. As soon as the completed questionnaires have been received, they will be given careful consideration by the Council itself and, as promptly thereafter as possible, arrange-

ments will be made to give the various colleges an official inspection. On the basis of the questionnaire returns and the data compiled as result of inspections, the Council proposes to issue a list of accredited colleges of pharmacy, this list to appear not later than September, 1939.

The standards for accreditment as finally adopted deal, among other things, with the organization and administration of the colleges, the subject matter of the curriculum, qualifications of the faculty members, equipment and apparatus available for instructional purposes, with special emphasis upon laboratory and library facilities and financial structure. The Council recogizes that proper financial support is absolutely essential to a sound educational program and, for this reason, will refuse recognition to any college of pharmacy after 1944 that does not receive at least twenty per cent of its income from other than student fees.

While the Council will deal effectively with those conditions in pharmaceutical education which require improvement, it does, nevertheless, feel that four years of study leading to the bachelor degree is sufficient for the present to supply the necessary undergraduate training in pharmacy.

Andrew G. DuMez.

The American Council on Pharmaceutical Education as the Editor Sees It.

It will be the policy of the Journal to keep its readers in touch with the work of the Council. This can best be done by publishing in each issue excerpts from the minutes of the meetings.

The present status of the Council's activities can be gleaned from the Annual report of Secretary DuMez, published in the October, 1937 number of this Journal and from Exerpts published in this issue. In a word—the final draft of the standards for accreditment of colleges of pharmacy has been prepared and published in booklet form and has been distributed to the deans of all colleges together with a questionnaire to be filled out by the institution seeking accreditment and returned to the Secretary by February 15, 1938. This questionnaire calls for a mass of information which

the Council must have in order to facilitate the work of inspection when the visits actually begin. The next step, therefore, is for every institution seeking accreditment to supply the material called for at the earliest possible moment and at a date not later than indicated.

For many years the American Association of Colleges of Pharmacy maintained a standing committee which worked arduously to interest some foundation or some standardizing institution to undertake a survey of pharmacy with the ultimate aim of the standardization of colleges. All these attempts failed for reasons that need not be mentioned now. With the passage of time the standards for membership in the American Association of Colleges of Pharmacy have become the traditional minimal standards for pharmaceutical education and these standards have been read into the consciousness, not only of all educators and administrators, but into the consciousness of the men who make and administer the law. A few years ago there came out of the mind of Andrew G. DuMez a clearer vision of a better plan for measuring and taking stock of our teaching institutions. The plan consisted essentially of creating a pharmaceutical standardizing body composed of representatives from the three great bodies representing education, law administration and practice of professional pharmacy, namely—the American Association of Colleges of Pharmacy, the National Association of Boards of Pharmacy, and the American Pharmaceutical Association.

The work of the American Council on Pharmaceutical Education since its creation has been characterized by methods of procedure which are deliberate, studious, conservative, and fair. Standards of accreditment have been formulated as the result of the most careful study. These standards have been referred to the faculties of our colleges time and again for study and suggestions. Because of the constructive criticism the Council has changed, modified and rewritten the standards time and again. When a point had been reached which seemed to be satisfactory to all concerned, these standards were put to the test by making a study upon a number of schools representing different types of organization. As a result of these trials, the Council again modified the standards along lines that would seem to be fair and just and yet have a standard that would mean some-

thing and be of value to the individual colleges to be studied and to the improvement of pharmaceutical education as a whole. If these objects are not attained by the work of the Council, its creation and its effort will be a failure. The work of the Council will not be destructive. It will be creative. It is a tool of our own manufacture to be used to improve our educational system. When the writer catches sight of the committee sent to study the institution he represents, he expects to experience the same thrill that he has had when, being stalled on a Nebraska prairie, he caught the first glimpse of a wrecking car as it swept over the crest of a hill, bearing upon its burnished sides, in flaming letters a foot in height, the legend—"Here comes help". And if out of that study the Council does not fulfill the spirit of the legend, the writer and the institution will be disappointed in the efficiency of our newest tool. As a result of the earnest and sympathetic cooperation between the tool and every institution, the writer can vision the dawn of a new era for pharmaceutical education.

Rufus A. Lyman.

American Association of Colleges of Pharmacy and Proposed Food and Drug Legislation

From the start of the present movement, the American Association of Colleges of Pharmacy has been interested in the attempts of the Secretary of Agriculture and the Food and Drug Administration to secure more effective legislation for the control of the manufacture, distribution and sale of food and drugs. When the first bill was introduced, S. 1944, the so-called Tugwell Bill, the Association took no action but several representatives of member-colleges expressed their individual opinions of this bill, pointing out that, in many ways, they thought that it was too drastic. After this bill had been modified and became S. 2800, the Association's Committee on Food and Drug Legislation appeared before the Senate Committee at a hearing on this bill and urged its passage. In addition, the Executive Committee of the Association went on record in favor of the bill and in favor of better food and drug laws.

Quoting from the Report of the Executive Committee submitted to the Association on May 7, 1934: "During the past year some eight or ten bills have been introduced into Congress for the purpose of amending or replacing our present Pure Food and Drugs Act. These bills have been thoroughly discussed in the pharmaceutical and lay press and all of us must be more or less familiar with their general provisions. The American Association of Colleges of Pharmacy, primarily because it holds membership in the National Drug Trade Conference, seemed to have been placed in an unfavorable light regarding these bills. As an Association there is but one position for us to take and that is that we favor legislation for the protection of the public by proper control of sale and advertisement of foods, drugs and cosmetics. The Chairman of your Executive Committee was instructed to appear before the Senate Committee that had the Senate Bill 2800, the so-called Copeland Bill, under consideration. Dean A. G. DuMez, one of our alternates to the Drug Trade Conference, and your Chairman prepared a statement of the position of the American Association of Colleges of Pharmacy and your Chairman presented it to the above-mentioned Senate Committee. We were granted a respectful hearing and we believe we were instrumental in correcting, at least in some measure, any wrong impression that may have become current regarding the position of the American Association of Colleges of Pharmacy toward this important legislation. Thus far no food and drug bill has received action by Congress, but Senate Bill 2800 with amendments has been favorably reported by the Senate Committee and may be called up any day. It seems to your Executive Committee that this legislation is too important for us to ignore and therefore we should take a definite stand regarding it. After careful consideration your Committee recommends that the following rsolutions be approved by the Association:

First. The American Association of Colleges of Pharmacy is vitally interested in any attempt to improve the control of the sale and the advertisement of food, drugs, and cosmetics and it goes on record as highly in favor of legislation that will properly protect the public against the advertisement or sale of fraudulent, misrepresented, poisonous or deleterious food, drugs or cosmetics.

Second. That the Association goes on record as favoring Amended Senate Bill 2800 as reported by the Senate Committee on Commerce on March 15, 1934, or a bill of equal or greater merit."

Both of these resolutions were approved by the Association on recommendation of Dean Jordan seconded by Dean Rudd. The Association received considerable caustic criticism from some of the prominent pharmaceutical leaders of the Nation because it approved these resolutions, but this did not deter the Association in its activities for better food and drug legislation.

On March 2nd, 1935, Deans Rudd, DuMez, Little and Jordan represented the Association at a hearing on S. 5 and Dean Jordan presented the prepared statement for the group. (See "Hearings before a Sub-committee of the Committee on Commerce of the United States Senate, Seventy-fourth Congress, First Session on S. 5" p. 61-64.)

On March 8th, 1935, when hearings on S. 5 were continued, Deans DuMez and Little represented our Association and Dean Little, then the President of the Association, expanded the statements presented on March 2nd (See above report of Hearings pp. 190-191).

Ever since the annual meeting in 1933, the Association has had a Special Committee on Food and Drug Legislation consisting of three or four members and an auxiliary committee consisting of one member from each state in the Union. The members and auxiliary members of this Committee have been active in creating favorable public opinion for food and drug legislation. Several members of this Committee and other pharmaceutical educators have addressed public gatherings such as luncheon clubs and Leagues of Women Voters, etc., pointing out the need of such legislation and urging public support of it. In addition Congressmen have been contacted for the same purpose.

The recent exploitation of "Elixir of Sulfanilamide" which resulted in some eighty deaths, has emphasized the need of better control of products placed upon the market by drug firms that do not have good pharmacology departments and do not carefully conduct pharmacological tests upon their products before offering them to the public. In several of the northern states, the "Elixir of Sulfanilamide" was distributed through the dispensing doctors only, thus eliminating

the retail druggist. However, a careful check shows that approximately 75% of the "Elixir" was distributed through the retail drug trade. No censure can be attached to the pharmacists who dispensed this "Elixir" on a physician's prescription. The retail pharmacists would not have purchased the "Elixir" if they had not been given to understand that there would be a call for it on a physician's prescription. The physicians themselves would be the first to criticize a pharmacist who refused to compound a prescription for a patent or proprietary medicine. We are indeed sorry and ashamed that one or two retail pharmacists counter-prescribed this preparation. Counter-prescribing by a pharmacist is contrary to "Pharmaceutical Ethics" and never to be condoned, but counter-prescribing a cure or treatment for a venereal disease deserves **severe censure.** The pharmacists of this country have, for the most part, cooperated well with Surgeon General Parran in his splendid effort to wipe out these diseases and any counter-prescribing of remedies for them should be stopped at once. In many states the Boards of Pharmacy and the Pharmaceutical Associations did all in their power to assist in removing this "Elixir" from the shelves of the drug stores. Unfortunately such efforts were not made public and few persons have known of these efforts. The excellent service rendered by the Food and Drug Administration in this crisis is to be heartily commended.

In conclusion: the American Association of Colleges of Pharmacy, although it regrets that no new food and drug bill has been passed, will continue its efforts toward securing such a law. Its Committee and the Auxiliary Committee on Food and Drug Legislation are still active and will continue their activities until the goal is reached.

Respectfully submitted,

W. F. Rudd
A. G. DuMez
Ernest Little
C. B. Jordan, Chairman.

"It Can Be Done."---A Lascoffism

In a precommencement announcement to the Editor, Dean H. Everett Kendig makes the following statement, "I

believe it will interest you to know that Temple University will confer the degree of Doctor of Science on J. Leon Lascoff at the Founder's Day Midyear Commencement, Tuesday, February 15, 1938. It is my feeling, and shared by President Beury, that much good will accrue to professional pharmacy by recognizing Doctor Lascoff's outstanding work as a practitioner of pure pharmacy. Nearly all of the degrees, as far as I can determine, conferred through recommendation of schools of pharmacy, have been granted because of achievements in the field of pharmaceutical education or for work done in organized pharmaceutical efforts. Rarely has the actual practice of the profession been so honored. If the practice of the profession and the practical application of the ideals we discuss so much are recognized and emphasized, as in the case of Doctor Lascoff, I believe it will be a definite stimulus to other pharmacists to consider professional practice more seriously, and will take their thoughts away from the commercial practices which are such a dominant influence today. Aside from all this, Doctor Lascoff's life work as a whole entitles him to the recognition which we propose." The Editor is certain that there will not be a single dissenting note to the sentiment expressed in Dean Kendig's letter. Of the many inspiring experiences the Editor has had in his visits to New York City, nothing can be compared to the time which he spent after the midnight hour in the Lascoff store on Lexington Avenue, last August. Into that store the owner, like the weaver of a Persian rug, has expressed and revealed the idealism in his soul and has made it the dominating factor in a world of reality. The slogan "It can be done" has become inseparably connected with Doctor Lascoff's ability to compound incompatible prescriptions. The slogan might just as well be applied to his ability to run a dignified, inspiring, scientific, and yet commercially profitable drug store in the heart of New York City. Well does the writer remember when at the last meeting of the related pharmaceutical bodies in Toronto, Canada, he suggested for the hundredth time, that the time had come when boards of pharmacy might well undertake the standardization of drug stores and as usual the statement met with vigorous opposition. It was J. Leon Lascoff who came to his rescue with the declaration "It can be done". To a man with such an indomitable spirit with such a record of scientific and

practical accomplishment behind him, the Editor does not hesitate to congratulate, in the name of the American Association of Colleges of Pharmacy, Dean Kendig, President Beury, and Temple University, for recognizing such worth and conferring upon Doctor Lascoff the highest honorary degree in science. At the same time the Editor assumes the prerogative of coining a new word—lascoffism—which in the pharmaceutical parlance of the future will be defined as "It can be done."

Rufus A. Lyman.

Have They Died in Vain?

The daily newspapers have carried the story of the tragic death from the administration of Elixir of Sulfanilamide-Massengill. More than seventy innocent victims have laid down their lives because this new drug was administered in a dosage form labeled "Elixir," when as a matter of fact the solvent used was not an elixir at all, as usually defined, but diethylene glycol—a commercial solvent with no background of pharmaceutical application and a record of relatively high toxicity. The manufacturer who devised this preparation, undoubtedly thought he had "hit" on something very desirable but he evidently rushed it to the market without determining whether the combination of sulfanilamide and diethylene glycol was safe to use in the dosage advocated.

There is now a disposition in some quarters to place all the blame for the unfortunate results from the use of this preparation at the doorstep of the maker and the dispensers—physicians and pharmacists—when, as a matter of fact, the medical and pharmaceutical professions, the drug industry, our law makers and the general public all must share in the blame for this tragedy. The medical profession has been entirely too ready to rely upon advertising claims for drug products without requiring scientific proof of therapeutic value and safety. The drug manufacturing industry has been entirely too eager to produce products for profit without due regard for the hazards involved in combining drugs without complete knowledge of the effect of such combinations. Retail pharmacists have been entirely too ready to dodge responsibility for the quality and usefulness of products furnished on prescription or dispensed over the counter, just because they are supplied by manufacturers.

Law makers have been entirely too ready to listen to and act upon the arguments of constituents with a personal interest in the emasculation of laws and regulations which would provide the kind of control that is in the best interests of the public.

The people themselves have been entirely too apathetic to the necessity for restricting the manufacture and distribution of drugs and medicines and their exploitation through newspapers, magazines and the radio.

Of course it is deplorable that so many lives had to be sacrificed in order that the people of the United States might come to a realization that their government is at present powerless to protect them against the promiscuous production and distribution of drugs and medicines of questionable value.

It would be an outrage if after this heartbreaking demonstration of the lack of supervision by the Government over potent drugs offered for sale to the profession and to the public, there does not result prompt and effective revision of all Federal and State drug laws to prevent a recurrence of the damage to innocent victims which we have witnessed in connection with the marketing of Massengill's "Elixir of Sulfanilamide." Will the drug manufacturers of America, in the face of this terrible disaster, continue to protect the weakest link in their chain of factories by giving aid and comfort to those who for purely selfish reasons have up to now prevented the enactment of a more stringent federal food and drug law? Or, will there be, at last, a definite cleavage between those manufacturers who have assumed the responsibility that goes with professional practice and have placed their processes and products upon a scientific basis, and those who are in the *drug business* for profit alone? If this cleavage does not come voluntarily and if there is any disposition on the part of the industry to "take the rap" for the weak links because of fear that advocating more stringent regulations may work "hardships" upon legitimate industry, it is time for the Government to "crack down" and "crack down" hard on the entire group from the highest so-called ethical manufacturer to the very lowest quack remedy producer.

Let the industry now show whether it is dominated by dollars or by some conception of the responsibility that goes with the production of agents directly affecting human lives. It is not sufficient to say "We believe in strong food and drug laws" and then offer all kinds of amendments and changes in wording specifically designed to weaken governmental control over the very things that close the door to fraud and quackery. It is not sufficient to agree to the necessity for a new law and then attempt to weaken its enforcement by dividing control between two agencies of the government. The present situation calls for clear, honest thinking and support of a program of regulation which the decent manufacturers in the drug industry know is necessary. The scientific and professional personnel in the drug industry should not permit the sales organization to dominate thought and action in this field. If the industry wants to save its face, let its professional management now come forward and speak as members of the honored profession of Pharmacy which does not condone quackery and which does not need the legal protection afforded by professional hamstringers of legislation proposed in the public interest.—*Reprinted from the New Jersey Journal of Pharmacy, October,* 1937.

THE EDITOR'S PAGE

Time marches on! And with the march the Editor has been inveigled into becoming a member of another association. This time it is the International Brotherhood of the Victims of the Amygdalectomist. Two arguments were presented to induce him to embrace the fellowship of this organization,—one was that the American contingency constitutes seventy-three per cent of the population and it does not draw a line on sex. This gives him an advantage in case he should develop some political ambitions that even a democrat might cherish. But the second argument made a greater appeal. He was told that this amygdalectomy would turn the poison away from his blood stream and he would begin to think more logically and see things more clearly. In his own case, the Editor has seen the need of this for a long time, but he did not realize that his colleagues recognized it until five or six of them, from different parts of the nation, descended on him the day after Christmas in an Indianapolis hotel demanding of him what he considered the answer to the pertinent question,—What is the next step in pharmaceutical education? When he said that the answer to that question was as much their responsibility as his, they denied the charge and called his attention to the fact that his last report on the work of the American Council on Education described the formation of a Conference on Professional Education and one of the problems to be discussed at the next meeting of the Conference is "How far should preliminary education be required of all professions?" The Editor is the Association's representative in that Conference and they wanted to know what his answer would be to that question. As a matter of fact only a few days before, he had been asked the same question by the dean of a college of pharmacy in a great western university. Here is given his answer to that dean—"In developing our work in pharmacy I hope we will maintain our balance and not make the mistake the medical men have made in trying to make a first class scientist out of every student who completes the medical curriculum. From our viewpoint it is very important to develop men to do research directed toward the cause and control of disease.

But from the taxpayer's point of view he is concerned about having a doctor in his community who can relieve him of a stomachache when he gets one and take care of his wife when she is having a baby. The tragedy of medical practice in my state is that the country-side is more poorly cared for in a medical service way today than it was when I graduated in medicine at the turn of the century. At the same time the larger cities are so crowded with doctors that few can be honest and make a decent living. I think the state would be better off in a health way if we had tried to make scientists out of ten per cent of the men who graduate in medicine and practitioners out of the other ninety per cent. I hope in view of the present situation in medicine this is not a heretical statement.

There is a feeling at the present time amongst a great many pharmaceutical educators that we should not have a pre-pharmaceutical year. Practices of other professions such as law, medicine and dentistry are contagious, but I hope we will not lose our heads. There is plenty to do yet in most of our undergraduate colleges to improve the undergraduate training and when that has been done, I think the next move is to begin to develop our graduate work rather than to require a pre-pharmacy year for all students intending to practice pharmacy. By so doing we will be able to train the ten per cent for research and educational careers and leave the ninety per cent to occupy our drug stores.

I also think that it is not wise to attempt to develop every undergraduate curriculum along the same lines. There are locations and many conditions which require a modification of the undergraduate curriculum. And if there is a better way to develop undergraduate work we certainly will not find it by trying to develop every school along the same pattern. There is as much danger in such regimentation as there is in the government's attempt at regimentation of every thing that concerns our daily life." This answer seemed to satisfy the Editor's colleagues because one of them remarked that that was the first time he had ever known the Editor to talk sense. This seemed to be the universal consensus of opinion. However, it does not seem as simple as it might because the Editor knows a lot of deans who think they have a strong undergraduate college when they have not. He knows others that think they are ready to give

graduate work when they do not even know what graduate work is. He knows still others who think that half of the pharmacy course can be given just as well in a college of liberal arts or a Presbyterian seminary as in a college of pharmacy. For all such deans, the Editor advises an immediate amygdalectomy.

In the editorial pages will be found an article on the diethylene glycol tragedy reprinted from the New Jersey Journal of Pharmacy. The Editor thinks he can see in it evidences of the clear thinking of Robert P. Fischelis. A number of editorials have been received which were written at different stages of this tragedy—but as new information has appeared they did not exactly fit the case. The borrowed editorial seems to fit the present status of the case. It is written without prejudice and free from malice and places responsibility upon not one but many, where it belongs. Some have felt that our national pharmaceutical organizations should have been active in trying to take the "elixir" off the market. They felt that organized pharmacy should have been as active as the Food and Drug Administration and the American Medical Association were in this effort. The Editor has had such a feeling also and yet we must remember that this is the business of the Food and Drug Administration and I as a medical man know that in every patent medicine or new medicinal product that is put upon the market, a doctor will be found somewhere occupying a key position in its production and promotion. In this particular type of medical product, the dispensing doctor is used by a particular type of manufacturer to introduce it to the public. And so the medical profession ought to feel an unusual responsibility in such cases. The Indiana Pharmaceutical Association deserves great credit for immediately taking steps to find out if any of the "elixir" had found entrance to the stores of that state. This experience should be a powerful influence for the passage of food and drug legislation that will not only protect the consumer at the point of distribution, but at the point of manufacture as well.

Almost thirty years have passed since the Editor first declared it to be his opinion that training in physiology and pharmacology should constitute an essential part in the training of a pharmacist if he is to become a safe compounder of prescriptions, a capable standardizer of medicinal

products, a safe purveyor of poisons, and an intelligent operator of a drugstore. Twenty years later the Commonwealth Study confirmed what had been called a visionary policy and this issue of the Journal is an indication of the amount of water that has run over the dam since that time. The masterful study of James M. Dille and the papers which come from the Teachers Conference on Pharmacognosy and Pharmacology speak for themselves. The greatest development in our schools of pharmacy in the next few years will come in the field of pharmacology. The sulfinalimid "elixir" incident is as powerful an argument for the pharmacological training of the druggist as it is for better food and drug legislation.

With the march of time two more stalwart souls have passed on. As is his practice, the Editor has asked those who knew them best to pay them the tribute they so richly deserve. All the Editor asks is to be permitted a word of comment. Eber Hugh Wisner I never knew. I am grateful to Dean Jordan for this peek into his quiet useful life. The influence of such a life may be more far reaching in usefulness than many a noisier one. He has left a fine record of service. Such a life is both an inspiration and a benediction for us.

To me, the passing of Charles H. LaWall was not a shock. It was the triumph of another Easter morning. As I went about my daily task I found myself repeating the majestic lines of the Battle Hymn of The Republic—

"In the beauty of the lilies, Christ was born across the sea:
With a glory in his bosom that transfigures you and me:
As he died to make men holy, let us die to make men free,
While God is marching on."

Charles H. LaWall struggled for a lifetime to make men free and his soul is marching on with God. Charles H. LaWall was honest rugged individualism, personified. He was a worthy product of that soil consecrated in history by the work of honest, rugged, William Penn. His indomitable spirit, his courage, his tolerance, branded him as a member of the fraternity that rides the open range. He belonged to the West as much as to the East. I admired him because of his academic and scientific attainments. I loved him because of what he was.

Rumor has it that the young men who attend the

annual meeting of the American Association of Colleges of Pharmacy are given nothing to do and get nothing out of it. It has also been rumored that there was much disappointment over the New York meeting. For these reasons they were asked and urged to express their views through the columns of the Journal. This they have done clearly, courageously, and courteously. In doing so, each one has contributed to pharmaceutical progress. These expressions of opinion set men to thinking. The Editor would like to contribute a paper on the contribution of young men to the work of this Association in the thirty years he has been in constant touch with it, but space does not permit. For their satisfaction may he for a moment reminisce. For twenty-five of these years, the great struggle within the membership of this organization was to push the training of a pharmacist from one year of high school and two years of college training to four years of high school and four years of college training. That fight was a struggle of youth against men of mature years. Youth won. Even when some of the membership withdrew from the Association because they felt the advance was too rapid, the young men in those schools regretted it. They not only regretted it, they were humiliated by it and now these young men are again coming into their own. In all these years the Editor cannot recall a single forward movement which did not have the support of the young men as against the more conservative opinion of men of mature years. Even in the establishment of this Journal, it was the support of the young men that gave the Editor courage to carry it through. Since its establishment it has been the cooperation of young men that has made it go. Nothing in the last decade is doing more to give pharmacy a place in the galaxy of the sciences than the program of the Subsection on Pharmacy of the American Association for the Advancement of Science. This program is being carried on by our young men at their own expense. The Teachers Conferences have been the effort of the young men. To make these what they ought to be is a great responsibility. The committee work of our Association is being done by young men, for most of it they, only, are qualified. The next Syllabus will be the product of our young men's efforts. I expect to see a different Syllabus. There has been a suggestion that the Executive Committee should have some young

men on it in order that they may be trained for it. The work of the Executive Committee is of great importance. The training for that Committee is off of it rather than on it. When a young man has behind him a series of accomplishments and a wealth of experience and can bring to the Executive Committee a new or special contribution, then he is ripe for it. When a man has that record all he has to do is to wait and work. The same is true of other key positions in the Association's organization. After all, it is not possible to say which is the most important work, which is the most important position, or which is the most important man in the pharmaceutical educational machine. It is all essential. Perhaps every worker in the pharmaceutical field can get some inspiration from the philosophy of the tapestry weavers—

"Let us take to ourselves a lesson—no lesson can braver be—
From the ways of the tapestry weavers on the other side of the sea.
Above their heads the pattern hangs: they study it with care:
The while their fingers deftly work, their eyes are fastened there.

They tell this curious thing besides, of the patient, plodding weaver:
He works on the wrong side evermore, but works for the right side ever.
It is only when the weaving stops, and the web is loosened and turned,
That he sees his real handiwork,—that his marvelous skill is learned.

Ah! the sight of its delicate beauty, how it pays him for all its cost!
No rarer, daintier work than his was ever done by the frost.
Then the master bringeth him golden hire, and giveth him praise as well;
And how happy the heart of the weaver is, no tongue but his own can tell.

The years of man are the looms of God, let down from the place of the sun,
Wherein we are weaving always, till the mystic web is done,—
Weaving blindly, but weaving surely, each for himself a fate.
We may not see how the right side looks: we can only weave and wait.

Nor ever more need the weaver be troubled with doubt or fear,—
Let him look to the great Ideal, the pattern will appear:
And when his task is ended, and the webb is turned and shown,
He shall hear the voice of the Master, saying to him, "Well done."

An error was made in the report of the Chairman of the Executive Committee as given on page 467 and in the Summary on page 447 of Volume I of the Journal. Under honorary degrees the phrase—Doctor of Philosophy—should read Doctor of Pharmacy. The former degree was not granted by any institution in 1937 as an honorary degree but the latter was granted in two cases.

The Index for Volume I, printed separately, for binding, is enclosed with this number. To Professor Zada M. Cooper belongs the credit of preparing it. A tedious job, well done.

Your attention is again called to the fact that renewals for Volume II of this Journal are now due and must be paid at once in order that we may comply with the special mailing privileges granted by the United States Post Office Department. Send your check at once to Professor Zada M. Cooper, Treasurer, College of Pharmacy, University of Iowa, Iowa City, Iowa.

Gleanings from the Editor's Mail

There ought to be a field for such a magazine as the American Journal of Pharmaceutical Education. I shall be surprised if its publication isn't welcomed by teachers in schools of pharmacy and by many of the commercial pharmaceutical institutions as well.

LOTUS D. COFFMAN
President, University of Minnesota.

I appreciate deeply your having sent me the numbers constituting Volume I of the American Journal of Pharmaceutical Education and I have thoroughly enjoyed reading them. I have already written Professor Cooper and sent my check for my subscription to Volume II of your publication. J. LEON LASCOFF.

I believe that the American Journal of Pharmaceutical Education has found a real place for itself and that it is already accepted as a constructive force for good in our field. Please renew subscriptions for the Maryland Board of Pharmacy for 1938.

ROBERT L. SWAIN
Secretary, Maryland Board of Pharmacy.

The fourth number of the American Journal of Pharmaceutical Education has arrived and I read it from cover to cover. I noted especially Doctor Little's comments on the New York meeting. He asked for comments from others who were there. I am too young a man to criticize and what I say some may think presumptuous. But in the meeting of the conference on teachers of pharmacognosy, I was greatly disappointed by the papers. I had looked forward to the conference hoping for guidance and stimulation from men of much more experience than I. Most of the papers were poorly organized and poorly given. The best ones were those of the younger men. They were not up to the papers given in the general meetings or to the reports of committees.

At the summer meeting of the American Association for the Advancement of Science in Rochester in 1936, I gave a paper before the Subsection on Pharmacy. Here too, some of the papers were rambling and not given in a direct forceful way. I believe, further, that the quality of our various scientific meetings would be greatly improved if we would spend more time on the preparation and more thought on the delivery of our scientific papers. Perhaps pharmacists are no worse than other scientists, but we could do better.

Please do not think I did not enjoy the meeting in New York. I derived much from the sessions, but was disappointed in this one aspect.

RICHARD A. DENO
School of Pharmacy, Medical College of Virginia.

I was very much interested in the editorial page of the proceedings number (October 1937) of the "American Journal of Pharmaceutical Education". In connection with the editorial discussion of the needs of pharmaceutical education, I note that the editor invites an expression of views concerning the points mentioned for publication in the January number.

I have also been much concerned for the past several years to note that men who have accumulated wealth from pharmaceutical

industries have, to a large extent, ignored pharmacy and pharmaceutical institutions in making grants and bequests. As a matter of fact, I have had some correspondence with some of the larger pharmaceutical manufacturing organizations with reference to this attitude. In one instance I was requested to express my views concerning a policy which a pharmaceutical organization might follow in making grants-in-aid. I am quoting below my answer to this request.

"First, I believe it would be a good business policy for a pharmaceutical organization, financially able to do so, to regularly provide an item in its annual budget for 'Grants-in-aid to pharmaceutical institutions,' this sum to depend on the financial status of the organization. This is sound business policy for the reason that whatever promotes the progress of the profession would enhance the business interests of the industrial organization having as its customers the members of that profession. The interests of the two are mutual and progress in one promotes progress in the other. Goodwill of its patrons is considered an important essential for business success and consequently any policy which would tend to promote goodwill can be considered a business asset. Material assistance to pharmaceutical institutions would undoubtedly result in goodwill on the part of the members of its profession toward the organization providing such aid.

"Second, this sum should be apportioned to deserving institutions competent to utilize such funds in a manner that would result in an evident contribution to the profession. It is not necessary that every institution receive a grant-in-aid every year, neither is it necessary that every institution assisted receive an equal amount. A grant should be determined by need and the amount of the grant, within reasonable limitations, be determined by the extent of need, as well as ability to utilize such grant to the best advantage. In this connection I should like to point out that a grant that would make possible facilities for improvement of instruction in a school or college which could be used profitably by succeeding generations of students would be preferable to a grant which would be of benefit primarily to a single student.

Institutions desiring assistance should present a request outlining the project in detail and indicating benefits to be obtained therefrom, together with an itemized estimate of funds needed.

It is my opinion that such a policy would meet with the approval and support of administrative officers of pharmaceutical institutions and the members of the profession in general. I feel confident that occasional assistance would be highly appreciated and that there would be little likelihood of getting into trouble in the administration of such a policy. I do not believe that any institution would expect regular assistance nor would they be unreasonable in their requests. Undoubtedly one grant would satisfy for a number of years. Neither do I believe that all such institutions would make requests at the same time. Hence, a few could be assisted each year and therefore, in the course of a few years, many institutions would be enabled to carry out projects otherwise impossible. Thus the benefits therefrom could be widely distributed and varied in nature."

I hope that readers of the Journal will study this carefully and offer suggestions and comments. I hope, further, that the American

Association of Colleges of Pharmacy will consider this matter of sufficient importance to give it further study and attention.

I sent my personal copy of the October number of the American Journal of Pharmaceutical Education to a pharmaceutical manufacturer, calling his attention to the editorial page. I have had some correspondence with this company concerning grants-in-aid to pharmaceutical institutions. Hence, your editorial was much appreciated by me and I am hoping that it will be productive of not only comment but constructive activity on the part of both pharmacists and manufacturers.

B. V. CHRISTENSEN,
School of Pharmacy, University of Florida.

Your mention of the diethylene glycol incident reminds me of an event that happened when Dr. E. Fullerton Cook was here. He spoke on the occasion of the dedication of our building and mentioned the "elixir" incident and pointed out that the compound was not adequately tested before it was placed upon the market and that there was a place where the professional pharmacist would have been of service. He continued at length on ways in which pharmacy is the bulwark of the nation's health. Afterwards I asked him if he actually had not meant pharmacology. I told him that a pharmacologist with a dozen rabbits could have prevented the tragic loss of life that resulted from taking the "elixir" but that a pharmacist no matter how well he had been versed in the science of preparing drugs could not have gotten a single inkling of the physiological danger in that "elixir". He said he saw the point and realized that every pharmacist should have pharmacological training. But I wish he had brought that out in his speech.

JAMES M. DILLE,
College of Pharmacy, University of Washington.

A formal "interim revision announcement" of changes in three of the U.S.P. XI monographs is enclosed. One of these, dealing with the Benzoin test was released some time ago but is repeated in this official communication.

Please copy these statements, if possible, in the current issue of the American Journal of Pharmaceutical Education so that they may be given the maximum of publicity. E. FULLERTON COOK, Chairman.

The following revision of the U.S.P. XI tests is hereby announced through the authority of the Committee of Revision and the action of the Board of Trustees and will become official one month from the date of this release.

AQUA AURANTII FLORUM, Page 64

Change the test for residue on evaporation to: "Evaporate 100cc. of the Orange Flower Water on a water bath, and dry the residue to constant weight at 100°C.; not more than 0.005 Gm. of residue remains."

BENZOINUM, Page 86

Omit the test for "rosin", lines 13 and 14 from the bottom of the page.

OLEUM AMYGDALAE EXPRESSUM, Page 248

Omit the test for the solidification point of the fatty acids, lines 9 and 10 from the bottom of the page.

Notes and News

On January 31st to February 2nd, inclusive, the University of Minnesota will hold its second Pharmaceutical Institute for the benefit of the pharmacists of the state, the purpose of which is to keep the druggists in touch with the most recent advances in the professional field. The faculty of the Institute is composed of members of the faculties of the College of Pharmacy, the School of Medicine, and the College of Science, Literature, and Arts of the University of Minnesota. In addition there will be a number of distinguished lecturers from outside the University. The list includes Dr. F. F. Blicke, Professor of Pharmaceutical Chemistry, University of Michigan; Dr. F. J. Heck, Assistant Professor of Medicine, Mayo Clinic; Dr. H. A. Irvine, Special Consultant for the Minnesota State Board of Health; Dr. A. J. Chesley, Secretary of the same Board; and Dr. J. D. Ralston of Detroit. The Institute will be held in the Center for Continuation Study, which is a new University project now in its second year, which offers the opportunity for post graduation study. The building of the Center is especially adapted to this type of education in that it includes good living accommodations, dining, car storage, and lecture room facilities.

A series of fine lectures is being given as a continuation study program at Wayne University, College of Pharmacy. The program is being sponsored by the University and the Detroit Retail Druggists Association. On December 3rd Dr. A. D. Emmett of the Park, Davis Research Laboratories, discussed "Vitamins in Relation to Health and Disease". The next lecture "Endocrinology and Pharmacy" will be given on January 7th by Dr. D. R. Kitchen of the same laboratories.

Dr. H. M. Burlage of the College of Pharmacy of the University of North Carolina has been elected Chairman of the Syllabus Committee to succeed Dean J. Grover Beard, resigned. Dr. Burlage has been acting chairman since Dean Beard's injury, early in the year.

Dr. Howard B. Lewis, Professor of Biological Chemistry and Director of the College of Pharmacy of the University of Michigan has been made a member of the Executive Committee of the Medical School of that institution to serve for a period of three years.

On October 19, 1937 the faculty of the College of Pharmacy of the University of Nebraska gave a courtesy program to the Lancaster County Medical Society at Lincoln. Professor F. S. Bukey discussed his researches on the value of enteric coatings; Dr. J. B. Burt discussed Chlor-mercuri cavacrol, as a possible new anteseptic; Dr. Harald G. O. Holck who attended the Fifth Nordic Physiologists' Congress at Upsala, Sweden, in August, 1937, discussed a selected series of reports that was given at the Congress; and Professor H. I. Redford gave a demonstration of some of the ointments and vehicles manufactured in accordance with the requirements of the United States Pharmacopoeia XI.

In December Dr. Glen Wakeman, Professor of Chemistry at the University of Colorado spoke before the Journal Club of Chemistry, Pharmacy, and Physics of that Institution. He outlined a number of papers that were presented at the summer meeting of the American Chemical Society at Rochester, New York, October 28, 1937.

Arthur Spangler, a student in the School of Pharmacy of the University of Oklahoma was chosen as one of seven candidates to represent the University in the examination for the Rhodes Scholarship to be held at Oklahoma City in December.

Professor Ralph A. Beegle of the School of Pharmacy of the University of Oklahoma will sponsor a drug merchandising short course in the University Union Building, January 17-22. The course will be divided into four parts: accounting, drug store merchandising, advertising and sales, and soda fountain. A number of speakers of national reputation will take part in the program. On October 21, Dr. Ralph Bienfang addressed the Chemists Club of Central Oklahoma at Oklahoma City on "Odor Fixation and Classification".

Dr. Ivor Griffith, Professor of Pharmacy at the Philadelphia College of Pharmacy and Science has been elected to the deanship to succeed the late Dr. Charles H. LaWall. Late appointments to the teaching staff of the same institution are Drs. William Reuning and Robert P. Sechler to the Department of English; Mr. Elmer M. Brincley and Dr. Donald P. LeGalley to the Department of Physics, and Dr. Howard S. Kaltenborn to the Department of Mathematics. Mr. E. Emerson Leuallen in chemistry and Miss Madeline O. Holland in pharmacy are new assistants. Dr. Francis C. Lawler, formerly of the Department of Bacteriology has accepted a position in the School of Medicine of the University of Oklahoma.

During the holidays the Medical College of Virginia moved its out-patient department into the new half-million dollar clinic building. An interesting feature of the new building is the pharmacy which includes a dispensing laboratory especially equipped for teaching purposes. Here, prescriptions will be compounded for patients in the hospital and in the out-patient department. Special features of the pharmacy included the room for the preparation of sterile solutions with autoclaves and other necessary equipment for this work. There is also a special room for stills. A large room for bulky material adjoins the work room proper and a sub-basement for the storing of chemicals in large quantities. The teaching staff has its own storage space. A large portion of the new quarters has been altered for manufacturing since it is planned to make all preparations that can be profitably prepared by the pharmacist and the students under the direct supervision of the faculty. The students will also be made familiar with the special problems of hospital pharmacy.

On February 17th the Medical College of Virginia will hold a pharmaceutical symposium which is a part of its centennial celebration. The general theme of its program will be "The Pharmacy, The Physician, and Public Health." Dr. J. Leon Lascoff will be the guest of honor and guest speaker. His subject will be "The Pharmacist and The

Physician", Dr. I. C. Riggin, Student Health Commissioner of Virginia will speak on "The Pharmacist and Public Health" and Mr. Eldon Roberts of Newport News will speak upon the subject "The Practice of Professional Pharmacy".

On Tuesday evening, November 23, 1937 a notable event occurred at the Hotel William Penn in Pittsburgh. A dinner was given by the President and Deans of Duquesne University in honor of Dean Hugh C. Muldoon on the occasion of his election as the thirty-eighth president of the American Association of Colleges of Pharmacy. Speakers on the program included the Very Reverend J. J. Callahan, President of the University, deans of the various colleges, and Dr. George D. Beal, Assistant Director, The Mellon Institute.

It has been recently announced that the Executive Committee of the Arkansas Pharmaceutical Association is seeking the establishment of a school for pharmacy in the University of Arkansas at Fayetteville. This is a step in the right direction. There may be too many colleges in some parts of the country but it is certainly true that every state should build up its own institutions and a college of pharmacy should be a unit in every state's educational system. Only when this is accomplished can the taxpayers of a state develop a pharmaceutical consciousness.

Plans are being considered by the trustees of Columbia University looking toward the securing of endowment funds for the College of Pharmacy. Dean Ballard of that institution is right when he says that pharmaceutical education is in a perilous position when it has to depend upon student fees alone for support. State supported schools will be doing a service to pharmacy as a whole by proceeding along similar lines.

The following is an editorial printed in the Nebraska State Journal early in December—"The Journal of the American Medical Association, commenting on the elixir of sulfanilamide that is charged with the deaths of 61 persons, says: "Under our present laws the responsibility for protection of the public rests on the food and drug administration, which is as inefficiently armed as a hunter pursuing a tiger with a fly swatter". It is hoped that the medical association will remember this when revision of the food and drug act comes before congress again. Attempts to strengthen the laws in recent years have met with violent opposition, some of it from organized medical sources. All agree that the laws should be strengthened but there is a distinct unwillingness to compromise on the method to be used in bolstering the laws." Reprinting the editorial here is in no way a criticism of the medical profession. It, however, is evidence that the layman is cognizant of the fact that the public is inadequately protected by our present drug laws and that they are looking toward medical sources for legislation that will protect them from a repetition of the diethylene glycol incident. It is just as much the responsibility of the allied medical professions to bring this about as it is to protect the public against the ravages of smallpox, diphtheria and typhoid.

MEMORIALS

EBER HUGH WISNER

Eber Hugh Wisner, Dean of Ferris Institute College of Pharmacy, Big Rapids, Michigan, died at 11:30 A. M. Thursday, November 4th in the Community Hospital in Big Rapids from a streptococcus infection of the liver. He lived a life devoted to the teaching profession, starting to teach in the public schools in the state of Michigan in 1901. Dean Wisner followed his profession until October 1st, when illness forced him to bed from which he never arose, being taken to the hospital shortly after being stricken.

Dean Wisner was born in Lewanee County, Michigan, April 7, 1881. He attended the grade schools and high school, finishing his college preparatory work at Ferris Institute in 1905. He received his life certificate in Special Science in 1906 from Michigan State Normal College at Ypsilanti and graduated from the University of Michigan with the Bachelor of Science and Pharmaceutical Chemist degrees in 1910. He worked for his Master's degree at the University of Michigan during the summers of 1909-10. He received his practical experience in the D. F. Jones Pharmacy at Watertown, South Dakota, from 1910-13.

He married Elizabeth Farley to whom four sons were born: Garrett, of Buchanan; Robert, of Ionia; Phillip, of Detroit; and Harold Wisner, a student at Western State Teachers College at Kalamazoo.

Mr. Wisner was a public school teacher from 1901 to 1909; principal of the Gladstone, Michigan, high school from 1906-07; head of the science department of the Watertown, South Dakota, high school between 1910-13; Dean and Professor of Materia Medica and Pharmacognosy of the Pharmacy College at Valparaiso University, Valparaiso, Indiana from 1913-17. He was partner and manager of the Wisner Pharmacy at Buchanan, Michigan from 1920-27; an instructor of Materia Medica and sciences at Ferris Institute, 1927-33, from which time he held the position of Dean of the College of Pharmacy at the Institute.

Among the honors bestowed upon him was an awarded membership in the American Pharmaceutical Association in 1912 for having passed the South Dakota State Board of Pharmacy with a mark higher than any attained in the three previous years. He was a member of the Michigan State Pharmaceutical Association, of the Big Rapids Chamber of Commerce, and a charter member of the Ferris Institute chapter of Kappa Alpha Phi Fraternity.

Dean Wisner's hobbies were divided between nature study hikes, fishing and archery, and in the latter he was an instructor at Ferris Institute.

Funeral services were held Sunday afternoon at the Methodist Church with burial in the Highland Park Cemetery.

It was my pleasure to have met Dean Wisner while he was a

student at the University of Michigan, and during the long years intervening we have been personal friends. I admired him for his honesty of purpose, devotion to his profession and the many sterling qualities he manifested. Like many of us, he was unable to put into practice his professional ideals; therefore, he was content to give his best service but not satisfied with the conditions as he found them and was always looking forward to the time when they would be better. In his passing, pharmacy has lost a loyal worker and many of us a true and faithful friend.

C. B. JORDAN.

CHARLES H. LaWALL

Charles H. LaWall, Dean of Pharmacy of the Philadelphia College of Pharmacy and Science, a distinguished scientist, teacher, and writer, and an outstanding personality in American pharmacy, died of pneumonia at the age of sixty-six on December 7th.

He was born at Allentown, Pennsylvania and was of German and French-Huguenot ancestry. His father was a pharmacist and conducted a store in Allentown, and later in Bloomsburg, Pennsylvania, where young Charles graduated from high school, and where he continued his education in an institution now known as the Bloomsburg State Teachers' College. During these student days his spare time was spent as an apprentice in pharmacy, first in his father's store and from 1888 to 1891 in the employ of Moyer Brothers, a wholesale and retail drug firm in Bloomsburg.

In 1891, and at the age of 20, he came to Philadelphia and enrolled in the Philadelphia College of Pharmacy, where his personality, and his exceptional mental gifts, soon drew the attention of Professor Remington through whose good offices he procured a position in the laboratory of the Smith, Kline and French Company, wholesale and manufacturing druggists. Here he served on a part-time schedule while attending college, and on full time as assistant chemist for several years after graduation, and here obtained his foundational practical training as an analyst.

In 1900 he was appointed as instructor in pharmacy under Remington, and functioned with such outstanding success that he was characterized by his students as "quizz-master extraordinary".

In 1905 he became associated as a junior partner with Dr. Henry Leffmann, a celebrated chemist and scholar who conducted an analytical laboratory in Philadelphia. When Dr. Leffmann retired from active practice, to devote his time to research and to literary work, the junior partner, LaWall, became the sole owner of this laboratory and carried on the work in his own way, spcializing in food and drug analysis for the Pennsylvania Department of Agriculture, serving as chemist for the Pennsylvania Board of Pharmacy and, also, from time to time, as the Philadelphia analyst under instructions from Dr. Harvey W. Wiley of the United States Department of Agriculture. He attained to high standing as a chemist and a pharmacist consultant for numerous manufacturing firms; and from 1931 to the time of his death he was a member of the International Committee for the Study of Opium Assay.

He did not, however, devote all his time to the analytical laboratory, but continued his teaching at the college, and in 1906 was promoted to associate professorship in the theory and practice of pharmacy, a position he held up to the time of the death of Remington in 1918, when he became a full professor and a dean of the college from which he had graduated.

His capacity for work was extraordinary. He helped Remington in the revision of his Practice of Pharmacy, became associate editor in collaboration with Dr. H. C. Wood in the revision of the United States Dispensatory, served on the revision committee of the National Formulary, and of the United States Pharmacopoeia, on which latter committee he was active continuously from 1910 to the time of his death. From 1918 he was co-editor, with E. Fullerton Cook, of Remington's text book. He found time, notwithstanding these many exacting tasks, to perform a labor of love for the profession he adorned, namely, in becoming its historian, and writing an authentic and readable history of pharmacy, which bears the title, "Four Thousand Years of Pharmacy".

In association work he was outstanding. He not only presented numerous contributions on scientific topics, but served on many committees and held many offices. He was president of the Pennsylvania Pharmaceutical Association in 1911, president of the American Pharmaceutical Association in 1919, and president of the American Association of Colleges of Pharmacy in 1923.

In recognition of his service to pharmacy, the University of Pittsburgh, in 1919, conferred upon him the degree of Doctor of Pharmacy, *honoris causa*, Susquehanna University, in 1920, bestowed the degree of Doctor of Science, and American Pharmacy honored him with the Remington Medal award in 1927. He held membership in the American Association for the Advancement of Science, in the Society of Chemical Industry, in the American Chemical Society, in the Philadelphia Botanical Club, in the Pennsylvania Botanical Society, in the Society of Public Analysts, in the Royal Society of Arts, in the Franklin Institute, in the American Medical Association, in the Philadelphia Academy of Natural Sciences, and in the Philadelphia College of Pharmacy and Science, his Alma Mater.

He was a versatile man, and a man of many accomplishments. It may, however, be said that his greatest successes were achieved in the class room, where his inspirational personality, his friendliness, his wealth of knowledge, his ability to present the material of his lectures properly organized and with the clarity which characterizes good diction, combined to make him a really talented and effective teacher. The "quizz-master extraordinary" of thirty-odd years ago, on whose shoulders had fallen the mantle of Remington, proved a most worthy successor to that noted teacher of pharmacy, fully justifying the wisdom of the selection he had made of an assistant in the year 1900, when LaWall entered the instructional corps of the College.

Charles H. LaWall, reared in the atmosphere of an old-time apothecary shop, never lost his love of professional pharmacy, and never lost his faith in its future possibilities. While he was forward-looking, and believed in the necessity of repeatedly re-adjusting

the practice of pharmacy to the conditions of the times, he did not believe in sacrificing the high ideals of the apothecary of old on the altar of progress.

He was indeed a fine personality, fair and square, forthright, generous—a true friend. He practiced what he preached, and thus inculcated high ideals, not only by precept but also by example. His students and his colleagues on the faculty will not soon forget him. American pharmacy will miss him; and those of us who knew him intimately, will always hold him in affectionate remembrance.

J. W. STURMER.

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*A TRIBUTE TO CHARLES H. LAWALL**

from the American Association of Colleges of Pharmacy

I consider it a high honor to be allowed to represent the American Association of Colleges of Pharmacy at these memorial services of our departed friend Dr. Charles H. LaWall.

It would be presumptuous on my part to attempt to tell you anything of the work and achievements of Dean LaWall, even in the restricted field of pharmaceutical education. You are his friends. You have seen him in action and have watched with interest and satisfaction the development of many projects for which he was primarily responsible, or in which he played an important part.

A rereading of his presidential address delivered at Asheville, North Carolina in September, 1923 at the conclusion of his year as President of the American Association of Colleges of Pharmacy will serve as a reminder of his forward-looking vision in the field of pharmaceutical education and of the enthusiasm and the clarity of his presentation. It is indeed noteworthy, how many of his recommendations were later accepted as association policy and regulations.

One of the most re-assuring circumstances with which we are confronted today is the fact that we have so many well qualified fine young men in the field of pharmacy who stand ready to assume positions of responsibility when they are called upon to do so; young men not only of thorough formal training and adequate professional experience, but men of character and personality and reliability as well.

But even encouraging circumstances of this sort seem to furnish us with so little comfort when a leader of the type of Dean Charles H. LaWall is taken from us. We have lost, not only a capable worker in the field of pharmacy, but a loyal, sincere friend and associate, who will be greatly missed in the days to come.

Still, I do not feel that an occasion such as this need be entirely one of sorrow and dispair.

It is true that Dr. LaWall's pleasant smile, his hearty laughter, his cordial handshake and his friendly "hello" will no longer be seen and heard and felt in the halls of this old college where he has worked so diligently for many years. Yet I believe that, in a

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*Delivered at a memorial service for Charles H. LaWall, Philadelphia College of Pharmacy and Science, January 12, 1938.

manner equally real, he will still be among us in the years to come and that his influence and personality as well will be so definitely felt as to impress upon us the fact that the soul of Dr. LaWall, the only real entity in God's scheme of things, is and will remain among us. It will remain not only as a pleasant memory, but as a living, dynamic force which will bring action and continued progress for those projects with which he was associated and comfort and perhaps even joy to his loved ones.

Each one of us can, with little effort, recall many men whose names are recorded on the pages of history, who seem to have begun to live in the most real sense, when they departed from their earthly bodies; men who became great leaders of their time and who left behind them an influence and a soul, which will continue to grow and develop and enlarge its field of influence through all eternity. So it is with Dr. LaWall. If we can but accept and appreciate this thought, his departure will be made easier and his life more fruitful.

On a stone marking the burial place of Benjamin Franklin you will find the following inscription, "The body of Benjamin Franklin printed like the cover of an old book, its contents torn out and stripped of its lettering and gilding, lies here food for worms. Yet the work itself will not be lost. For it will, as he believes, appear once more, in a new and more beautiful edition, corrected and amended by its author."

That is simple. That is profound. It constitutes the kind of philosophy which is in keeping with the life of Dr. LaWall and which brings quiet serenity at times of great loss and great need.

Those of you who have been to London, and many of you who have not, know that Sir Christopher Wren, who was responsible for the beauty of so many churches in and about London, lies buried in Saint Paul's Cathedral, which is probably his greatest masterpiece.

His epitaph, found in this beautiful structure, also seems appropriate to this occasion. It reads as follows:

"If you would see his monument,
Look about you."

Is it not appropriate that we should repeat "If you would see Dr. LaWall's monument, look about you"?

If we will look through eyes and listen through ears tuned to the reception of values which are profound, we shall see not only the halls and laboratories of the college which he so richly contributed, we shall vision the spirit of pharmaceutical education which served as his great challenge. We shall also sense and very definitely formulate the spirit of this relatively small group of his many friends. We shall vision an attitude of mind which is not so much an expression of sorrow and remorse as it is a rather joyful expression of thanks which rises now as we commune together saying in utmost simplicity and sincerity "We thank thee God for the life of Dr. Charles H. LaWall."

If we listen still more attentively with ears sensitive to the reception of things spiritual, we can feel the response from our departed friend saying appreciatively and with considerable satisfaction "How fine that we are still together".

In the death of Dr. Charles H. LaWall, we have lost a highly respected friend and associate. The profession of pharmacy has lost an ardent, dynamic worker and the world has lost a gentleman of high degree.

ERNEST LITTLE.

THE KAPPA EPSILON TESTIMONIAL DINNER TO DEAN FREDERICK J. WULLING

A booklet has recently come to the Editor's deck commemorating a testimonial dinner given to the distinguished Dean Emeritus of the University of Minnesota by the Alpha Chapter of Kappa Epsilon at the Nicollet Hotel in Minneapolis. The speakers at the event were the Dean's colleagues of many years and Mr. D. F. Jones of Watertown, South Dakota. One of the touching events of the occasion was the singing of the following lines dedicated to the Dean by his students. (Tune of "There Is a Tavern in Our Town".)

There is a College in our town, in our town,
And it has gained a great renown, great renown,
It has gained its fame and laurels evergreen
Through the efforts of our most illustrious Dean,
And, although he is leaving and all of us are grieving,
The good that he has done will e'er remain, remain.
To you, Dean Wulling, unto you,
Are credit, praise, and honor due, honor due,
We are proud that we were students at your school,
And from you learned the pharmaceutic rule.
Adieu, adieu, kind friend, adieu, adieu,
We can no longer stay with you, stay with you.
We'll hang our harps on a weeping willow tree
And may the world go well with thee.

One can read between the lines a note of affection and the regard of his students which the Good Dean must cherish and find satisfaction in, even to a greater degree than in his accomplishments in the field of pharmaceutical science and education.

RUFUS A. LYMAN.

Miscellaneous Items of Interest

The Pharmaceutical Syllabus and Its Revision.

This statement represents one of a series of progress reports on the revision of the Pharmaceutical Syllabus, which, at the request of the Editor will be published in the American Journal of Pharmaceutical Education in order that its readers, who are primarily interested in pharmaceutical education, may be kept informed of the work of the Syllabus Committee. This is also done with the hope that all persons wishing to make comments, suggestions and criticisms will feel free to send them to the Committee, which will give them due consideration.

A brief review of what has been done to September, 1937, might be of interest. At the Dallas meeting (1936) of the American Pharmaceutical Association and allied bodies, a meeting of the Committee was held at which time it was decided to proceed witn the revision of the Syllabus. The writer was selected as Acting Chairman to serve in the place of Chairman J. G. Beard, who asked that he be relieved since he was to be on sabbatical leave from his institution for 1936-37. The Acting Chairman was instructed to distribute to interested persons (especially to individuals teaching the respective subjects) copies of the various outlines of the fourth edition for their comments.

The response to this request was very gratifying and the Committee asks that all who have not already done so, continue to send to the Chairman suggestions about these outlines, and other outlines and new policies.

At the New York convention a meeting of the Syllabus Committee was also held at which time Chairman Beard submitted his resignation much to the regret of the members present; in October the writer was elected to the chairmanship. Accordingly letters have been sent to the Committee to determine some matters of policy and procedure. Finally, following the general procedure used in the last revision, subcommittees dealing with the various outlines are in process of selection; these are to be composed of qualified authorities who are willing to work and are interested in pharmaceutical education. It is expected that this step will be completed early in January.

The Chairman, again, on behalf of the Committee solicits and welcomes suggestions from anyone interested; in this way it is felt that the next edition will be as free as possible from criticism and therefore, highly regarded. The progress of these subcommittees will be reported upon in the next issue of the Journal.

HENRY M. BURLAGE, *Chairman.*

National Drug Trade Conference

The annual meeting of the National Drug Trade Conference was held in Washington, D. C., at the Mayflower Hotel on Tuesday, December 7, 1937.

The meeting was fairly well attended, a number of visitors being present in addition to the delegates from the following organizations:

American Pharmaceutical Association
American Drug Manufacturers' Association
American Pharmaceutical Manufacturers' Association
American Association of Colleges of Pharmacy
Federal Wholesale Druggists' Association
National Association of Boards of Pharmacy
National Association of Retail Druggists
National Wholesale Druggists' Association
Proprietary Association

The American Association of Colleges of Pharmacy was represented by its appointed delegates: Dean W. P. Briggs, George Washington University, Dean J. Lester Heyman of the University of West Virginia, and A. G. DuMez of the University of Maryland. Dean W. F. Rudd of the Medical College of Virginia and Dean Ernest Little of the New Jersey College of Pharmacy were present as alternates. Professor William G. Crockett of the Medical College of Virginia was also in attendance.

In addition to routine matters, consideration was given to the reports and items listed below:

1. Report of the Committee to Prepare a Table of Potent and Toxic Drugs.
   Dr. James H. Beal.
2. Report of the Committee on State Narcotic Acts.
   Dr. R. L. Swain
3. Report of the Councilor to U. S. Chamber of Commerce
   Dr. Frederick Cullen
4. Report of the Committee on Endowment
   Dr. Ernest Little
5. Report of the Committee on General Status of Pharmacy and the Drug Trade
   J. Lester Heyman
6. Report of the Committee on Information Regarding Distribution of Drugs and Medicines
   Dr. Robert P. Fischelis
7. Report on New York World's Fair
   Harry Noonan
8. National Legislation:
   A. Food and Drug Legislation
   B. Fair Trade Laws
9. A special committee consisting of R. L. Swain, chairman, R. P. Fischelis and A. G. DuMez, presented a report showing the extent to which the socialization of pharmacy has progressed, and stressing the necessity for some concerted action to give pharmacy a place in the expanding public health programs of the federal and state governments.

The report of the Committee on Endowment, read by Dean Ernest Little, was well received and evoked considerable discussion. The following resolution dealing with the report was finally passed: "Resolved, that each individual organization represented in the National Drug Trade Conference appoint a committee to confer with the American Association of Colleges of Pharmacy, relative to the placing of grants and endowments so that the greatest benefits may be derived from them."

Considerable time was devoted to discussing food and drug legislation, as most of the delegates present had something to say on the subject. Dean DuMez reaffirmed the stand which the American Association of Colleges of Pharmacy has taken on this legislation and stated that he believed the Association was now prepared to go further and advocate formula disclosure and the deletion of the "Variation Clause" from the Food and Drugs Act as it now stands.

Mr. Carson P. Frailey, Secretary of the American Drug Manufacturers' Association was reelected President of the Conference and Mr. Rowland Jones, Jr., Washington representative of the National Association of Retail Druggists, was reelected Secretary-Treasurer. Dean A. G. DuMez was reelected a member of the Executive Committee.

A. G. DuMez.

Excerpts from the Minutes of the American Council on Pharmaceutical Education

TO THE MEMBERS OF THE COUNCIL:

Item No. 22—Minutes of the Eighth Meeting of the Council. The 8th meeting of the Council on Pharmaceutical Education was held at the headquarters building of the American Pharmaceutical Association, Washington, D. C., on December 6, 1937.

Time: 1:30 P. M. to 6:30 P. M.

The following members were present: Messrs. Kelly, Christensen, Swain, Taylor, Jordan, Leigh and DuMez. Dean Ernest Little and Mr. George A. Moulton were present by invitation.

A. *Booklet Containing Standards for Accreditment of Colleges of Pharmacy, etc.*

The first business taken up was a review of the printed booklet containing the following information on the Council and its activities:

Membership Roster
Historical Introduction
Constitution and By-Laws
Standards for Accreditment of Colleges of Pharmacy

After a lengthy discussion of the standards, in which all of the members present participated, the booklet was approved in toto on motion by Dr. Swain seconded by Dean Leigh and carried.

B. *Questionnaire Forms.* The printed questionnaire forms, which the colleges will be required to complete before an inspection will be authorized, were also reviewed in detail and finally approved on motion by Dean Jordan, seconded by Dean Leigh and carried.

D. *Procedure to be followed in Notifying the Colleges that the Council is Ready to Proceed with Inspection.* After an extended discussion, it was duly moved and carried:

1. That an application blank together with the booklet and two copies of the questionnaire forms be sent to each college of pharmacy in the United States as soon after December 15th as possible.

2. That the colleges seeking accreditment be requested to return the application blank and completed questionnaire forms so that they will reach the office of the Secretary of the Council not later than February 15, 1938.

3. That the colleges which do not intend to seek accreditment at this time so inform the Secretary of the Council in writing not later than the date set in the preceding paragraph.

4. That the colleges be notified that the cost of inspection must be borne by them, and that a uniform charge of not to exceed $175.00 will be made for each college regardless of geographical location, provided application for accreditment is made before February 15, 1938.

5. That the colleges be notified that inspections will be begun just as soon after February 15, 1938, as the itineraries can be worked out.

E. *Material and Letter to be Sent to Colleges of Pharmacy.* It was agreed that the booklet together with an application blank for accreditment and two copies of the questionnaire forms should be sent to each of the colleges of pharmacy in this country as soon as possible after December 15th. It was agreed further that a letter covering the points enumerated in "'D". should accompany this material.

F. *Material and Letters to be Sent to Boards of Pharmacy.* It was also agreed that this material should be sent to the Secretaries of each state board of pharmacy for their information and that a brief statement regarding the next steps which the Council intended to take in proceeding with the accreditment of colleges be sent with it.

President Swain of the National Association of Boards of Pharmacy and Secretary Christensen of that Association agreed to prepare a supplemental statement for the boards of pharmacy which would be sent out separately by the National Association of Boards of Pharmacy.

G. *Material for Release to Pharmaceutical Press.* The matter of releasing this material to the pharmaceutical press was next given consideration. After a thorough discussion of the matter, it was moved and carried that a statement suitable for release to the press be prepared by a committee consisting of Messrs. Kelly, Swain and DuMez.

I. *Disposal of Report of Secretary Zada M. Cooper of the American Association of Colleges of Pharmacy.* Secretary Zada M. Cooper of the American Association of Colleges of Pharmacy, referred the following report of the Committee on Curriculum and Teaching Methods to the Council.

"It is recommended that the following points be referred to the American Council on Pharmaceutical Education to be considered in formulating the proper standards for the improvement of pharmaceutical instruction in general:

"A. The occurrence of burdening the instructional staff with excessive teaching loads as well as clerical and mechanical tasks. It is felt that much of the latter can be more economically accom-

plished by truly departmental secretaries or stenographers and by proper stockroom assistance. For further discussion of these conditions reference may be made to the reports of Committee of the American Association of University Professors.

"B. Since it is exceedingly detrimental to efficient teaching, the elimination of the practice of requesting a staff member to instruct in two or more recognized fields instead of proper specialization in a single field is highly desirable.

"C. Elimination of all courses *for credit*, which tend to be 'review or cram courses' for state board examinations is recommended.

"D. New appointments to a pharmacy staff should be made only to individuals who have had a *basic undergraduate training* in *pharmacy* as well as graduate training, or its equivalent in experience in the fields in which they are teaching.

"E. Accreditment of schools offering graduate degrees in pharmacy with the requirement that no degree of an advanced character should be granted to individuals without undergraduate pharmaceutical training is proposed for consideration."

The report was read and discussed. On motion by Jordan, duly seconded and carried, your secretary was instructed to inform Secretary Cooper of the American Association of Colleges of Pharmacy, that the report had been received and that the points raised therein would be taken into consideration in the inspection of colleges for accreditment.

J. *Date of Next Meeting.* It was decided that the next meeting of the Council would be held on February 21, 1938.

A. G. DuMez, *Secretary.*

The Pharmacy Programs at the Indianapolis 1937 Meeting of The American Association for the Advancement of Science.

(N_2) Subsection on Pharmacy

By action of the Executive Committee of the Association, the Subsection on Pharmacy has been created under the general Section on Medical Sciences. The Executive Committee of the Subsection is Dean R. A. Lyman, University of Nebraska, Lincoln, Nebr., Chairman; Dean Wortley F. Rudd, School of Pharmacy, Medical School of Virginia, Richmond, Va., and Dr. Glenn L. Jenkins, University of Minnesota, Minneapolis, Minn.

Monday Morning Session, December 27, 10:00 a. m.; Ball Room, Antlers Hotel.

1. The Assay of Mydriatic Drugs. Alice Hayden, C. B. Jordan, and H. G. DeKay, Purdue University School of Pharmacy.

2. Homologs of Salol. The Salicylates of Isomeric Amyl Phenols and Amyl Cresols. H. G. Kolloff, J. O. Page and M. C. Hart, The Upjohn Laboratories, Kalamazoo, Mich.

3. The Chemical Constitution and the Physiological Activity of

the Latex of Ficus pumila L. Conrado F. Asenjo, School of Tropical Medicine, San Juan, Puerto Rico.

4. A study of the Toxic Principles of Red Squill. Floyd J. LeBlanc, Division of Pharmacy, South Dakota State College.

5. Gelsemicine Aconitine, or Pseudaconitine; Which Is the Most Toxic Alkaloid? K. K. Chen, Robert C. Anderson, and E. Brown Robbins, The Lilly Laboratories, Indianapolis, Ind.

6. Daphnia.—Indicator and dosimeter in Microphysiology. Arno Viehoever, Philadelphia College of Pharmacy and Science.

7. Mechanism of Action of Alpha Naphthylisothiocyanate—A New Organic Insecticide. A. Viehover and N. Tischler, Philadelphia College of Pharmacy and Science.

8. Enteric Coatings. J. T. Goorley and C. O. Lee, Purdue University, School of Pharmacy.

9. The Effect of Peptone on the Resistance of Staphylococcus aureus. George F. Reddish and Ella Burlingame, St. Louis College of Pharmacy.

10. Fluorescence Analysis of Some Alkaloids and Crude Drugs. A. Slesser and C. B. Jordan, Purdue University, School of Pharmacy.

11. The Determination of Volatile Oil in Vegetable Drugs. Elmer H. Wirth, University of Illinois, School of Pharmacy.

12. Chemical Analysis of the Common Milkweed. A. E. Rihn and H. G. DeKay, School of Pharmacy, Purdue University.

Joint Session of (N2) with the Medical Science Section.
Monday Afternoon, December 27, 2:00 P. M.; Ball Room, Antlers Hotel.

1. Inhibitions of the Autonomic Nervous System Which May Enter Through the Eyes. E. L. Jones, Cumberland, Md.

2. Influence of an Anterior Pituitary-like Principle on the Growth and Function of The Genitalia of the Male. W. O. Thompson, N. J. Heckel, P. K. Thompson and L. F. N. Dickie, 700 N. Michigan Ave., Chicago, Ill.

3. Leukaemia: Its Etiology, Nature, and Cure in Animals. Its Possible Relation to Certain Specific Diseases of the Human. M. W. Emmel, Agricultural Experimental Station, Gainesville, Fla.

4. Chronic Rheumatic Brain Disease as a Factor in the Causation of Dementia praecox. Walter L. Bruetsch, Indiana University and Central State Hospital, Indianapolis, Ind.

5. Investigations on Certain Basic Mechanisms Necessary for Complement Activity. E. E. Ecker, Institute of Pathology, Western Reserve University.

6. Dessicated Thyroid Feeding and Androgenic Function of Ovaries. R. T. Hill, Indiana School of Medicine, Bloomington, Ind.

7. The Problem of Evaluating the Clinical Activity of Ergot Preparations. Marvin R. Thompson, University of Maryland.

8. The Local Anesthetic Action of Thiazoles, Oxazoles, and Imidazoles. Charles L. Rose, The Lilly Laboratories, Indianapolis, Ind.

9. The Hemolytic Action of Sodium and Potassium Soaps. Leroy D. Edwards, School of Pharmacy, Western Reserve University.

10. Mechanism of Action of Aphrodisiac and Other Irritant Drugs. (Cantharidin, Yohimbine, and Capsaicin.) A. Viehoever and I. Cohen, Philadelphia College of Pharmacy and Science.

11. Light Deficiency Rickets in Monkeys (Macacus rhesus.) Henry J. Gerstenberger, Babies and Children's Hospital, Cleveland, Ohio.

12. New Pharmacological and Bacteriological Facts About Iodocholeates. Paul C. Goedrich, College of Pharmacy, Rutgers University, Newark, N. J.

13. A study on the Temperature Necessary to Cause Death in Fatigued Neurons as Compared With Resting Neurons. George D. Shafer and Royce K. Skow, Stanford University.

The abstracts of the papers presented at these meetings will appear in an early number of Science. The character of the program of the pharmacy section continues to show improvement and the interest and attendance is greatly increased. About 40 were present at the subsection program and 120 at the joint session. The names of those who signed the roster at the (N2) session is given below.

Roster:—C. B. Jordan, Lafayette, Ind.; A. G. Worton, Indianapolis, Ind.; I. J. Bacon, Cleveland, Ohio; Leroy D. Edwards, Cleveland, Ohio; R. Tzucker, Lafayette, Ind.; W. Slesser, Lafayette, Ind.; Parker Heath, Decatur, Ill.; J. C. Zimmerman, Decatur, Ill.; Arno Viehoever, Philadelphia, Pa.; Hugh C. Muldoon, Pittsburgh, Pa.; E. L. Jones, Cumberland, Md.; Malcolm H. Soule, Ann Arbor, Mich.; H. K. Kolloff, Kalamazoo, Mich.; Conrado F. Asenjo, San Juan, Porto Rico; Frank E. Robbins, Indianapolis, Ind.; C. O. Lee, Lafayette, Ind.; Ernest Little, Newark, N. J.; A. G. DuMez, Baltimore, Md.; Robert C. Wilson, Athens, Ga.; W. F. Rudd, Richmond, Va.; M. W. Emmel, Gainesville, Fla.; W. F. Ambroz, Indianapolis, Ind.; E. H. Niles, Indianapolis, Ind.; H. L. Kendall, Lafayette, Ind.; Haakon Bang, Pullman, Wash.; D. G. Meredith, Lafayette, Ind.; L. M. Parks, Madison, Wisc.; P. C. Goedrich, Newark, N. J.; E. H. Wirth, Chicago, Ill.; John M. Goodyear, Indianapolis, Ind.; Paul D. Brown, Indianapolis, Ind.; Ella Burlingame, St. Louis, Mo.; G. F. Reddish, St. Louis, Mo.; Rufus A. Lyman, Lincoln, Nebr.

The following letter from Dr. Malcolm H. Soule, Secretary of the Medical Science Section, is a challenge to the pharmacy group that must be accepted—

Ann Arbor, Michigan
January 8, 1938.

Professor Rufus A. Lyman
Secretary Subsection on Pharmacy
A.A.A.S.
College of Pharmacy, University of Nebraska
Lincoln, Nebraska

Dear Professor Lyman:

I do hope that your group is planning to have a strong program at the meeting to be held in Ottawa. The reputation you established in Indianapolis must be upheld and I shall do all I possibly can to help. Have you suggestions regarding joint meetings and other pertinent ideas?

We shall not have as many volunteered papers for the summer meeting as we had for the one at Indianapolis.

With kind personal regards, Sincerely yours,
Malcolm H. Soule, Sec'y.

The next meeting of the American Association for the Advancement of Science will be held at Ottawa, Canada, June 27th to July 2, 1938. Because of its nearness to the eastern part of the United States, we hope pharmacists in that region will feel a special responsibility to see that the program is well supported. Dean W. F. Rudd of the School of Pharmacy of the Medical College of Virginia is the Chairman of the program committee for 1938.

RUFUS A. LYMAN.

Some Problems Arising in the Teaching of the Microscopy of Powdered Endocrines to Students of Pharmacognosy*

MARIN S. DUNN
Philadelphia College of Pharmacy and Science

The author calls attention to the fact that since animal glands and their products have been given so much importance in the United States Pharmacopoeia XI and the National Formulary VI, it is necessary to recognize this fact in the planning of the course in pharmacognosy, unless the basic training in animal histology is given in some other course. The study of macerated glandular fragments presents a real problem and if the necessary basic animal histology, necessary for the understanding of this problem is to be taught in pharmacognosy it means an encroachment upon the amount of time now given to that subject. This loss of time may in part be compensated for by deletion of vegetable drugs from the official codes. It also creates a problem for the instructor who may not have had histological training and experience.

The author then discusses the exact procedure he would follow in a case where a three hour lecture and a nine hour laboratory course is offered.

The following summary concludes the paper:

(1) I believe that a certain amount of training in histological technique should be given to students of pharmacy, in the pharmacology laboratory, in connection with the study of the microscopical elements of the official dried and powdered animal glands.

(2) This training should, within the limits set by the relative importance of the subject, be sufficiently complete to

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*Abstract of a paper read before the Conference of Teachers of Pharmacognosy and Pharmacology, New York City, August 16, 1937.

at least allow intelligent reading of the text and reference books, and to enable the students to recognize the major animal tissues and elements under the microscope.

(3) For those students desiring it, opportunity should be provided for additional training in the field, possibly a short course in animal histology might be given in conjunction with his training in botany.

(4) To do justice to the work, sufficient time must be available. The amount of time needed will vary in the different colleges, but in many cases it may necessitate the allocation of extra hours to the pharmacognosy course.

Laboratory Work in Pharmacology for the Pharmacy Student*

A. RICHARD BLISS, JR.
School of Pharmacy, Howard College of Birmingham

The author first discusses some of the basic problems connected with the training of the pharmacist for the practice of pharmacy, both in the retail field and in the several pharmaceutical specialties such as manufacturing, teaching, and research and stresses the fact that the student and teacher, and not the curriculum, are the crucial elements in an educational program. Emphasis on educational principles in pharmaceutical training can best be secured by modifying the point of view and broadening the interests of those responsible not only for pharmaceutical education, but also for licensure.

The five objectives of a course in pharmacology as stated on pages 136 and 137 of the fourth edition of the Syllabus are given and belief in the sufficiency of the course as laid down in the Syllabus is declared.

The author expresses a fear of over standardizing of the pharmaceutical curriculum in general and of the course in pharmacology in particular.

In discussing the paper Dr. Dille expressed disagreement with the author as to the subject matter and outline for pharmacology in the Pharmaceutical Syllabus, and Professor

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*Abstract of paper read before the Conference of Teachers of Pharmacognosy and Pharmacology, New York Ciy, August 16, 1937.

Bellis pointed out that in New York there can be little elasticity of courses because the board of pharmacy prescribes what subjects shall be included and just how much time shall be allotted to each subject.

New Books

THE MACHINERY OF THE BODY.

By Drs. Anton J. Carlson and Victor Johnson. The University of Chicago, The University of Chicago Press, 1937, Chicago, Illinois. 558 pages. 187 illustrations. Price $4.00.

This book is what one would expect from the distinguished head of the Department of Physiology of the University of Chicago, and his associate. The subject matter is presented with the idea of making it understandable to students who have had no previous training in physics, chemistry, or the biological sciences. Such an approach is highly desirable rather than to plunge the student into a mass of physiological details so technical that the student is confused beyond hope of recovery. This has always been the bane of physiological texts of the college level. On the other hand certain sections of the book are starred. These sections lead the properly prepared student into the more complex fields of physiological study and foot notes are also given which help the student in the further quest of the unknown. The nature of the illustrations is even more unique than the text presentation. It is remarkable how the authors have by simple diagramatic figures illustrated and elucidated practically the whole field of physiological phenomena. A series of sound films to be used with the text have been prepared. They cover: Body Defenses Against Disease; Heart and Circulation; The Nervous System; and The Mechanisms of Breathing. The first number of the series has been seen by the reviewer. The mechanics of the film is of excellent quality. The book deserves a wide use in colleges of pharmacy as a class room text.

R. A. LYMAN.

BIOLOGICAL STANDARDIZATION, By J. H. Burn, M. D., Professor of Pharmacology at the College of the Pharmaceutical Society; London University. Cloth. Pp. 288; 64 illustrations. Price: $7.50. Oxford Medical Publications, Oxford University Press, 1937.

After nine years Burn's little book Methods of Biological Assay is out with a new title and the contents more than doubled. In the first part of the book the author deplores the procrastination of pharmacologists in abandoning the animal unit in favor of comparison with the now universally employed reference standards. He also discusses qualitative and quantitative methods of bio-assay, giving the various new methods of estimating the lethal dose killing fifty per cent of the animals (LD 50). In the main chapters the author has selected primarily the methods used in the pharmaceutical Society's laboratory in London, which ones he considers the best available.

These methods of assaying are succinctly and critically discussed with the aid of numerous excellent illustrations and tables. Particular attention is given to the evaluation of results. In chapter 3, Dr. Burn discusses the Mathematical Treatment of Results and in 30 pages, together with two valuable appendices, gives enough higher mathematics to bewilder at least ninety-nine per cent of our pharmacists. Fortunately the consoling statement is given—"that often it is possible to reach much the same conclusion by simple graphical methods." The references at the end of each chapter are right up to date. In our opinion no laboratory in which bio-assay is carried on can afford to be without this book.

H. G. O. HOLCK.

William Wood and Company (The William and Wilkins Company) Baltimore.

On an advertising page in this number is a list of books published by this Company. The reputation of this firm for publishing high class books is well known. A perusal of the titles in this list reveals the fact that many of them are suitable for class room texts and everyone of them should be on the shelves of the reference library.

The following excerpt is taken from a letter written by this company to the Editor of the Journal under date of December 21, 1937. "Herewith we send material for one full page advertisement in your Journal which we hope will be in time for the January issue. Just as we were the first advertisers in the Journal of the Association of American Medical Colleges, showing our confidence it would fill a necessary function, and leading other advertisers to follow, so we hope to be a leader of the procession of advertisers in your Journal which will help to place it upon its feet and make it a permanent success."

Signed—The Williams and Wilkins Company.

The Editor urges the colleges of pharmacy to investigate these books as texts and as works of reference, not alone because of the financial support this company is giving to the Journal, but because these books are good books and our class rooms and libraries need them.

McGraw-Hill Book Company, New York.

As the Journal goes to press a page of advertising has been received from the McGraw-Hill Company. This firm is the one that publishes a series of pharmaceutical texts sponsored by an advisory committee of the American Association of Colleges of Pharmacy. The Company's pioneer publication in the pharmaceutical field was the report of the Commonwealth study of pharmacy known as Basic Material for a Pharmaceutical Curriculum. While other pharmaceutical texts of quality are published by this firm this announcement is confined to new editions. These texts deserve consideration from all instructors in their respective fields.

R. A. LYMAN.

INSTITUTIONS HOLDING MEMBERSHIP IN THE ASSOCIATION

(Continued from Inside Front Cover)

NEBRASKA

Creighton University, College of Pharmacy, Omaha; William A. Jarrett, Dean (1916).

University of Nebraska, College of Pharmacy, Lincoln; Rufus A. Lyman, Dean (1913).

NEW JERSEY

Rutgers University, The State University of New Jersey, New Jersey College of Pharmacy, Newark; Ernest Little, Dean (1923).

NORTH CAROLINA

University of North Carolina, School of Pharmacy, Chapel Hill; J. Grover Beard, Dean (1917).

NORTH DAKOTA

North Dakota Agricultural College, School of Pharmacy, Fargo; William J. Sudro, Dean (1920).

OHIO

Ohio Northern University, College of Pharmacy, Ada; Rudolph H. Raabe, Dean (1925).

Ohio State University, College of Pharmacy, Columbus; Clair A. Dye, Dean (1900).

Western Reserve University, School of Pharmacy, Cleveland; Edward Spease, Dean (1902).

OKLAHOMA

University of Oklahoma, School of Pharmacy, Norman; David B. R. Johnson, Dean (1905).

OREGON

Oregon State Agricultural College, School of Pharmacy, Corvallis; Adolph Ziefle, Dean (1915).

North Pacific College of Oregon, School of Pharmacy, Portland; Antone O. Mickelsen, Dean (1914).

PENNSYLVANIA

Duquesne University, School of Pharmacy, Pittsburgh; Hugh C. Muldoon, Dean (1927).

Philadelphia College of Pharmacy and Science, Philadelphia.

Temple University, School of Pharmacy, Philadelphia; H. Evert Kendig, Dean (1923).

University of Pittsburgh, Pittsburgh College of Pharmacy, Pittsburgh; C. Leonard O'Connell, Dean (1909).

PHILIPPINES

University of the Philippines, College of Pharmacy, Manila; Mariano V. del Rosario, Dean (1917).

PUERTO RICO

University of Puerto Rico, College of Pharmacy, Rio Piedras; Lucas L. Velez, Dean (1926).

RHODE ISLAND

Rhode Island College of Pharmacy and Allied Sciences, Providence; W. Henry Rivard, Dean (1926).

SOUTH CAROLINA

University of South Carolina, School of Pharmacy, Columbia; Emery T. Motley, Dean (1928).

SOUTH DAKOTA

South Dakota State College, Division of Pharmacy, Brookings; Earl R. Serles, Dean (1908).

TENNESSEE

University of Tennessee, School of Pharmacy, Memphis; Robert L. Crowe, Dean (1914).

TEXAS

University of Texas, College of Pharmacy, Austin; William P. Gidley, Dean (1926).

VIRGINIA

Medical College of Virginia, School of Pharmacy, Richmond; Wortley F. Rudd, Dean (1908).

WASHINGTON

University of Washington, College of Pharmacy, Seattle; Charles W. Johnson, Dean (1905).

State College of Washington, School of Pharmacy, Pullman; F. H. Dirstine, Dean (1912).

WEST VIRGINIA

West Virginia University, College of Pharmacy, Morgantown; J. Lester Hayman, Director (1920).

WISCONSIN

University of Wisconsin, Course in Pharmacy, Madison; Arthur H. Uhl, Director (1909).